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ABSTRACT

Statistics are presented on infant mortality rates according to race, sex, family income, education of mother, and education of father. The statistics are based on data collected by a questionnaire mailed to mothers of legitimate births and to medical care facilities and mothers of legitimate infant deaths. Samples were selected from records of births and infant deaths in 1964, 1965, and 1966 which were filed with the National Center for Health Statistics. The data are presented in 22 tables. The three appendixes to the report provide: I. Sources and Limitations of Data; II. Definitions of Terms Used in This Report; and III. Source Forms. (Author/DB)

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Data from the
NATIONAL VITAL STATISTICS SYSTEM

Series 22
Number 14

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Infant Mortality Rates:

Socioeconomic Factors

United States

Statistics on infant mortality rates according to race, sex, family income, education of mother, and education of father. Based on data collected by a questionnaire mailed to mothers of legitimate births and to medical care facilities and mothers of legitimate infant deaths. Samples selected from records of births and infant deaths in 1964, 1965, and 1966 which were filed with the National Center for Health Statistics.

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DHEW Publication No. (HSM) 72-1045

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National Center for Health Statistics

Rockville, Md. March 1972

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INFANT MORTALITY RATES: SOCIOECONOMIC FACTOR

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INTRODUCTION

In this report information is presented for the United States on the relationship between risk of death in infancy and socioeconomic status of the parents.

The data presented in this report derive from the National Natality and National Infant Mortality Surveys of 1964-66. These surveys were designed to obtain, for samples representative of all U.S. births and infant deaths, kinds of information not available from routine sources such as certificates of birth or death. The use of very similar instruments for collecting and recording data in the two surveys enabled national estimates to be made of the numbers both of births and of infant deaths distributed with respect to the same kinds of variables. From these, estimates of infant mortality rates could be computed. National data have not previously been available on the variation in rates of infant mortality associated with many of the variables on which data were collected in these surveys—including the socioeconomic indicators considered in this report.

Three indexes of socioeconomic status were examined—education of father, education of mother, and family income in the year prior to the birth or the infant death. All three indexes showed a strong association with risk of infant death, this risk being between 50 and 100 percent higher in the lowest socioeconomic class than in the middle and upper classes. The high infant mortality rates in the lowest socioeconomic groups were relatively most marked for deaths occurring after the first week of life; for deaths due to respiratory disease, digestive disease, or accident; and among infants in the normal birth weight range (3,001-4,000 grams).

The infant deaths in the lowest socioeconomic group that are in excess of the number expected on the basis of rates in the highest socioeconomic group may be considered, in a broad sense, preventable. On this assumption it can be estimated that almost 50 percent of infant deaths in the lowest socioeconomic group are preventable. Among the total population of births, approximately one-quarter of all infant deaths are preventable in this sense. Among white infants of normal birth weight (3,001-4,000 grams), this proportion is almost 50 percent.

SOURCES AND LIMITATIONS OF DATA

Sources and limitations of data used in this report are described in appendix I and will be reviewed here only briefly.

The National Natality Survey of 1964-66 (NNS) was based on a probability sample of the file of microfilm copies of birth certificates received by the National Center for Health Statistics from 54 registration areas which comprise the United States. The NNS sample of 11,331 births was a 0.1-percent sample of the births registered in each area during the 3-year

period. The National Infant Mortality Survey (NIMS) was based on a probability sample of 1 out of every 11 deaths under 1 year of age included in the Current Mortality Sample (CMS) in the same years. The CMS was itself a systematic 10-percent sample of death certificates received each month by the 54 registration areas and forwarded to the National Center for Health Statistics on a monthly basis. The NIMS sample contained 2,490 infant deaths and was a sample of 1 out of every 110 infant deaths in the United States in 1964-66. As will be noted, members of either sample who were illegitimate have been excluded from analyses presented in this report.

Information on the members of these two samples was obtained from several sources, including birth certificates (NNS), death certificates (NIMS), and hospital records (NIMS). However, the primary source of the information on the socioeconomic variables used in this report was a mail questionnaire. The questionnaire was usually completed by the mother, but in rare instances it was completed by some other family member. The form in which the information was solicited is shown in appendix III. Usable questionnaires were received for 89 percent of the legitimate births and 88 percent of the deaths of legitimate infants. Appendix tables IV and V show that response rates were somewhat lower in young mothers, in racial groups other than white, in the West Region, and in nonmetropolitan counties.

For births in the NNS sample, legitimacy status was known or could be inferred either from answers to a direct question which appears on the birth certificate for 36 registration areas or, in other areas, on the basis of rules listed in appendix II. Questionnaires were not sent to the mothers of the 936 infants known or inferred to be illegitimate. Since legitimacy status is not recorded on death certificates, questionnaires were sent to the mothers of illegitimate infants in the NIMS sample. However, using rules similar to those applied to the NNS births (appendix II), it was possible to infer illegitimacy from the questionnaire and/or information on the death certificate for 330 members of the NIMS sample. These were excluded from the analyses. The data in this report were therefore based on 10,395 legitimate births and 2,160 deaths of legitimate infants.

To improve the estimates of the distribution of all U.S. births and infant deaths made from the data available from these samples, two procedures were followed. The first of these was imputation of information that was not available for individual sample members, using information from similar sample members for whom the relevant data were available. The method is described in detail in appendix I. The second procedure was the assignment of weights to individual sample members based on the representation of the sample within categories created on the basis of certain variables for which information is available from the certificates on all U.S. births or infant deaths. Again, detailed methods are described in appendix I.

The basic analytic procedure was to use these samples to derive national estimates of the distribution of births and deaths with respect to a particular variable or variables and to use these estimates as denominators and numerators, respectively, of estimates of infant mortality rates. Estimates of numbers of births are shown in the tables as annual averages over the 3-year period and are rounded to the nearest thousand. However, the infant mortality rates shown were computed on the unrounded estimates.

These estimates—whether of numbers or births or of infant mortality rates—were of course subject to sampling error. Approximate sampling errors are given in tables VIII through XI of appendix I. In the tables, estimates of the number of births are not shown for cells with less than 5,000 annual births, and estimates of infant mortality rates are not given for cells in which the average annual number of births was less than 25,000. The restrictions imposed by sampling variation are particularly limiting in respect to the conclusions that can be drawn from the estimates for the racial groups other than white. For black infants, comprising approximately 12 percent of the population of births, infant mortality rates reflecting variation in a single variable are generally reasonably reliable, but few meaningful cross-tabulations can be made. For infants other than black or white, comprising altogether only 1.5 percent of the births, even marginal rates are unreliable, and no separate estimates are given.

Data on birth weight were not collected for the NIMS sample in 1966. Tabulations involving this variable are therefore based on births and deaths in the 1964 and 1965 samples. Standard errors of estimates based on 2 years of data are also given in the tables of appendix I.

FINDINGS

Comparison of Socioeconomic Indicators

As already noted, information was obtained on three separate but highly correlated indicators of socioeconomic status—family income, education of father, and education of mother. Estimates of the distribution of legitimate births and of the relationship of infant mortality rates to these three variables according to race and sex of infant are given in table 1.

Before turning to the data on infant mortality, the marked difference between white and black infants in the distributions by all three variables should be noted. With respect to family income, for example, exactly one-half of the black but only one-sixth of the white births were in the lowest income category (figure 1).

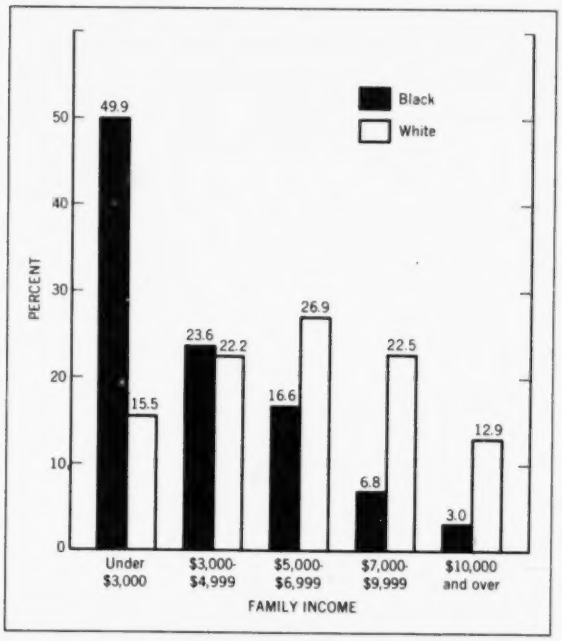

Figure 1. Percent of legitimate live births, by family income and race.

The difference was not so marked for parental education, but substantial differences in the same direction as those for income distribution were present. Since infant mortality rates were substantially higher for black than for white infants at all levels of each of the three variables, any examination of the role of socioeconomic status per se must evaluate the data for white and black infants separately.

Similar trends in infant mortality were seen for white infants in relation to all three variables and for both sexes. As illustrated in figure 2 from the data on education of father, the rates decreased regularly and substantially from the lowest to the central class. There was, however, no further decline in rates as socioeconomic status increased above that of the central class. That is to say, rates were quite similar in the three highest socioeconomic classes, and this was true whichever of the three variables was used to define the classes (table 1).

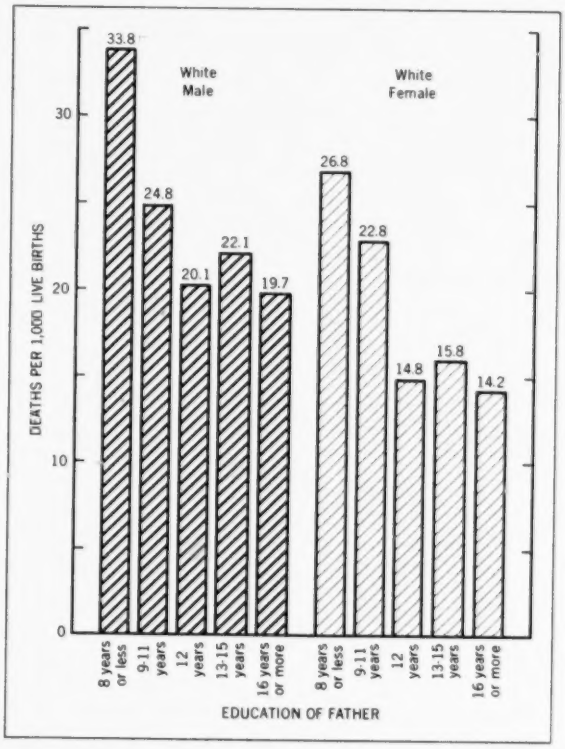

Figure 2. Estimated number of infant deaths per 1,000 white legitimate live births, by sex of child and education of father.

The trends for black infants were less regular, at least in part, because of the smaller numbers. In addition there were too few births in the two highest socioeconomic groups to examine mortality rates in them. Nevertheless, mortality rates for both sexes were lower in the central class—defined in terms of any of the three variables—than in either of the two lowest socioeconomic classes.

In table 1, the range of infant mortality rates between the lowest and highest socioeconomic classes is quite similar, whichever of the three variables is used to define the classes. The cross-tabulations in tables 2-4 can be used to compare the three variables as predictors of mortality. In view of the similarity of the trends for males and females seen in table 1, these and other analyses to be presented have been carried out for both sexes combined.

For white infants, the interrelationships between infant mortality risk and the three socioeconomic variables were complex. It appears that all three variables had effects that were, to some extent, independent. These independent effects were seen particularly in the lowest socioeconomic groups. For example, within each of the three lowest income groups, mortality rates declined substantially with increasing educational level of father (table 2) or mother (table 3). The same tables show that within the lowest categories of parental education there was a decline in mortality with increasing family income.

In table 4, which cross-tabulates infant mortality rates by education of mother and education of father, mortality rates are highest for infants born to parents who both had an 8th grade education or less. The mortality rate for white infants in this category (37.5 per 1,000) was almost double the rate for all white infants (20.8 per 1,000). Increasing educational level of either parent was associated with a decrease in infant mortality. Thus for white infants of mothers with an 8th grade education or less, the mortality rate fell from 37.5 when the father was of the same educational level to 18.1 when the father had a 12th grade education. For white infants of fathers with an 8th grade education or less, mortality fell from 37.5 when the mother was of the same educational level to 18.4 when the mother had a 12th grade education.

It appears, therefore, that within the lower categories of socioeconomic status, family income, education of mother, and education of father have independent and approximately equal predictive values in relation to infant mortality. The relationship may be characterized by the generalization that infant mortality rates were highest in families which measured low on all three socioeconomic variables; increase in socioeconomic status as measured by any one of the variables was associated with decrease in infant mortality rates, and the rates manifested in the highest categories of any single variable were not further reduced by taking cognizance of variation in the other two variables.

In the cross-tabulations of tables 2 and 3, the range of variation in infant mortality rates for white infants was slightly greater in association with parental education of either parent than with family income. It should be noted, however, that family income as measured in this study had certain intrinsic disadvantages as a measure of socioeconomic status. For example, the fact that the information related to the calendar year prior to the event—when the family income may have been changed by the circumstances of pregnancy itself—means that the income as reported may not represent the usual economic status of the family. It is quite conceivable, also, that there may be differences in accuracy of reporting of income and of parental education. The fact that item nonresponse was higher for family income than for any other variable is worth recalling (appendix I). It is possible, therefore, that the association of infant mortality with family income would be stronger if more accurate indexes of income were available.

Numbers of black infants in the surveys were too small to allow comparable analyses of the interrelationships between associations of mortality and the three measures of socioeconomic status.

Age of Mother

Tables 5-7 show numbers of births and infant-mortality rates according to the three socioeconomic variables and age of mother. The overall relationship of infant mortality to age of mother was similar to that which has been

observed many times in the past—i.e., high mortality rates among infants of the youngest mothers and also among those of the older mothers. There was a strong correlation between socioeconomic status and age of mother: births to parents with more education and/or higher family income tended to occur to substantially older mothers. However, this correlation does not account for any significant part of the relationship between infant mortality and socioeconomic status. In each category of maternal age—at least in the data for white infants and in those for "all races"—mortality rates generally declined from the lowest to the central socioeconomic class. The extent of this decline was of the same magnitude as that seen in the totals for all maternal ages.

Region and Urbanization

Tables 8-10 show mortality rates by the three socioeconomic variables for each of the four geographic regions of the United States and for metropolitan and nonmetropolitan counties within each region. Overall differences in infant mortality between regions were relatively small, particularly when differences resulting from differing proportions of births in racial minority groups were taken into account. Thus for white infants, the range was from 19.1 per 1,000 in the Northeast to 21.7 in the South and North Central Regions. Differences between metropolitan and nonmetropolitan counties were also quite small, except in the West Region. These relationships can, of course, be explored more accurately by means of routinely published statistics on all births.

With respect to the relationship between infant mortality and socioeconomic status within geographic regions, we should pay particular attention to the data for white infants since the proportion of births to other races differed markedly among regions. The associations of infant mortality with education of father in the four regions are compared in figure 3, using the rates for white infants and combining the three highest socioeconomic classes among which there was little variation in infant mortality rates. The differential in mortality rates with increasing education of father was most marked

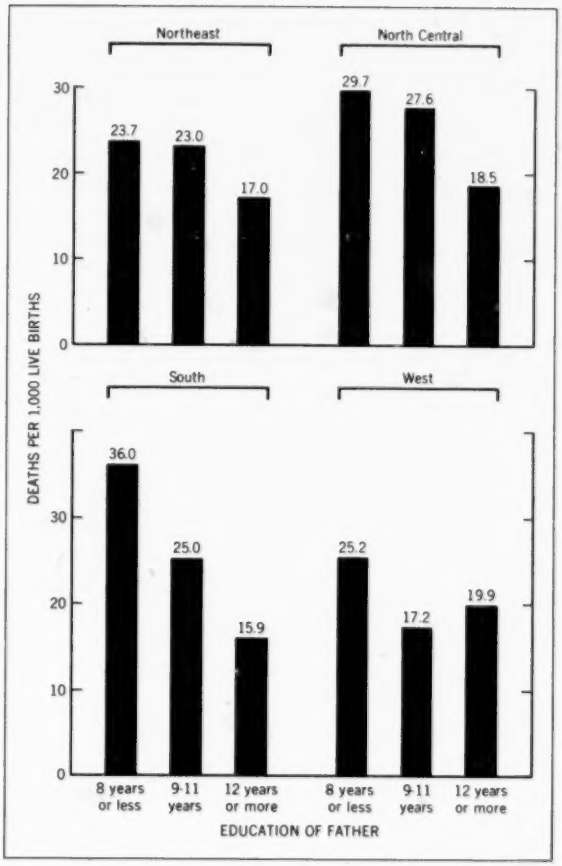

Figure 3. Estimated number of infant deaths per 1,000 white legitimate live births, by education of father and geographic region.

in the South and least marked in the Northeast and West. The same relatively low gradient of the trends with socioeconomic status in the Northeast and West was seen when education of mother (table 9) and family income (table 10) were used as indexes, but in these two tables the gradient in the North Central Region was quite as steep as that in the South.

The only region with sufficient black infants for separate analysis was in the South. The association of infant mortality with socioeconomic status appeared to be somewhat stronger in the South than in the data for all black infants, but the numbers of such infants in regions other than the South were too small for reliable, direct comparisons.

For white infants, the relationship between socioeconomic status and infant mortality appeared to be similar in metropolitan and nonmetropolitan counties. The particularly strong socioeconomic differential seen in the South and North Central Regions was observed both in the metropolitan and in the nonmetropolitan areas and was not consistently more pronounced in one than in the other. For black infants in the lowest socioeconomic groups, the rates tended to be higher—although not markedly so—in the nonmetropolitan than in the metropolitan counties.

Age at Death

Infant mortality rates by age at death and socioeconomic status are given in tables 11-13. A decline in mortality with increasing socioeconomic status was seen in all age-at-death categories, but was considerably more pronounced for deaths after the first week of life than for those in the more immediate postnatal period. The data on education of father for white infants are illustrated in figure 4, the three highest educational classes again being combined. After the first week of life, the infant mortality rates showed a threefold differential between the highest and the lowest education classes, whereas during the first week rates in the lowest class were only about 50 percent higher than those in the highest educational class. Examination of the detailed rates in table 11 shows about the same relative decline with increasing education of father for deaths occurring between 7 and 27 days as for those occurring between 6 and 11 months. They also reveal little evidence of further decline in rates between the central and the higher educational classes—even among deaths after the first week of life. The same trends by education of mother and family income are seen in tables 12 and 13, respectively.

The data for black infants were compatible with the same differential relationships by age at death, but were too few to draw definite conclusions.

Cause of Death

The relationships of 10 selected causes of death to socioeconomic status are given in tables 14-16, and the data on the eight major causes of death for white infants by education of father are illustrated in figure 5. Again, the number of deaths of black infants was too small for effective examination by cause of death and socioeconomic status simultaneously.

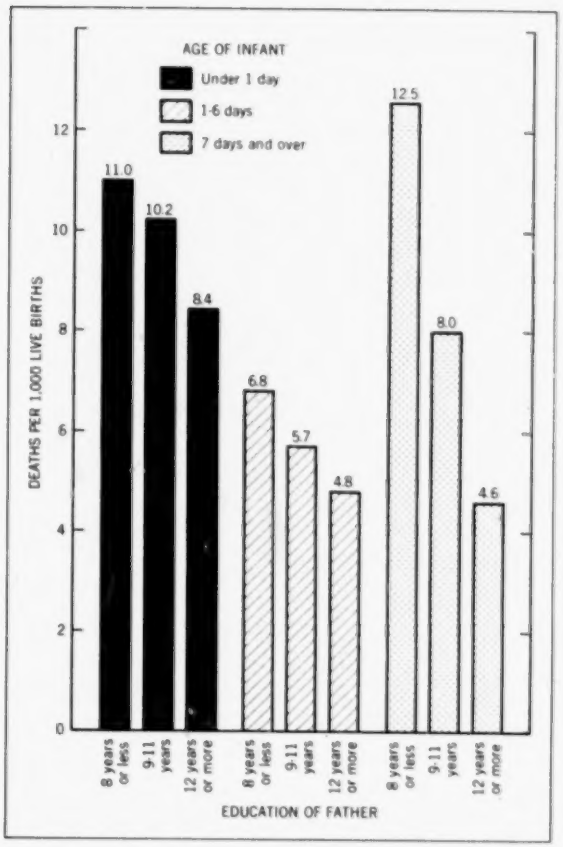

Figure 4. Estimated number of infant deaths per 1,000 white legitimate live births, by education of father and age of infant at death.

In the data for white infants, three groups of causes of death showed particularly strong declines in rates with increasing level of education of father—accidents, respiratory diseases, and digestive diseases. Less marked, but nevertheless clear, relationships to paternal education were also seen for deaths due to congenital malformation and to birth injury. The three cause categories showing the strongest relationship were all comprised of conditions which have their greatest impact after the first week of life, and the strong relationships between these

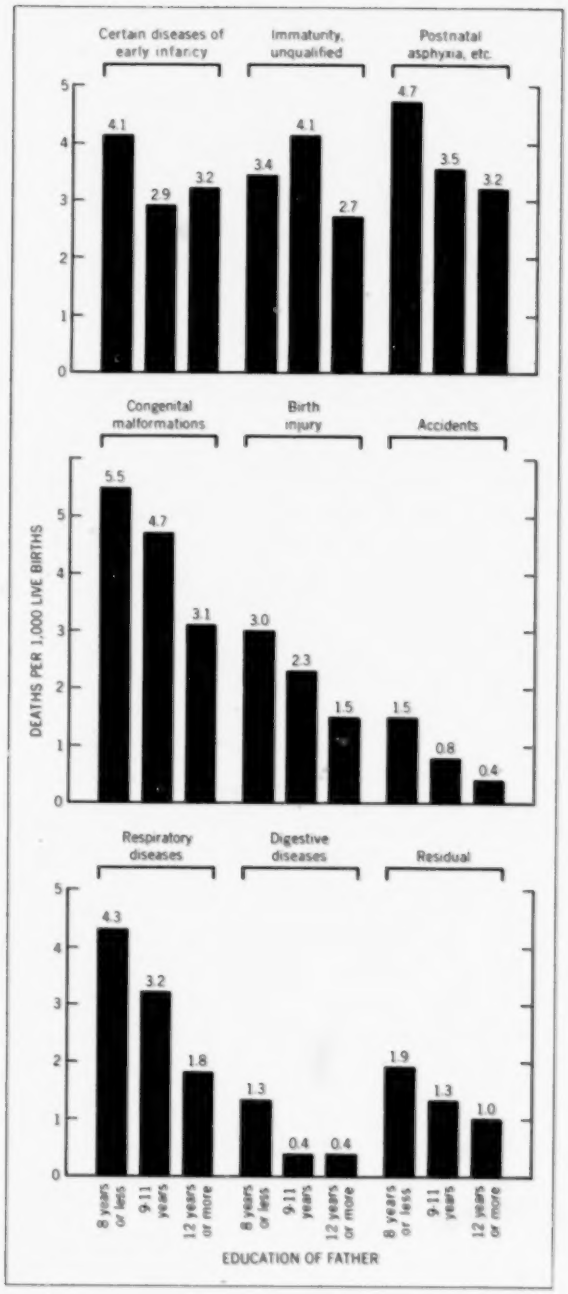

Figure 5. Estimated number of infant deaths per 1,000 white legitimate live births, by education of father, from selected underlying causes of death.

causes and socioeconomic status were consistent with the fact that the relationship of infant mortality to socioeconomic status was stronger for deaths after the first week of life, as noted in the section "Age at Death." Similar trends are seen using education of mother (table 15) and family income (table 16) as the indicators of socioeconomic status.

Birth Weight

Birth weight is one of the most important predictors of risk of death in infancy. Tables 17-19 show the distribution of births by birth weight and socioeconomic characteristics. Again, birth weight and race were strongly correlated. To examine the relationship with socioeconomic status per se, we must confine attention to the white births although quite similar trends were seen in the data for all races combined.

Among white infants, the percentage of births of low birth weight declined regularly with increasing socioeconomic status, whatever measure of the latter was used. For example, the percentage of births of 2,500 grams or less declined from 8.9 percent of births to fathers with an 8th grade education or less to 5.0 percent of births to fathers who had completed college. There was also a tendency toward a higher percentage of births over 3,501 grams in the upper socioeconomic classes—seen particularly in the tables on education of mother (table 18) and family income (table 19).

Mortality rates specific for birth weight and socioeconomic status are given in tables 20-22, and the data on education of father are illustrated in figure 6. For births that would satisfy the usual arbitrary definition of prematurity (2,500 grams or less), there was no consistent relationship between mortality and socioeconomic status. The absence of such a trend in these tables should not, of course, be interpreted as evidence that there is no association between low socioeconomic status and infant death due to prematurity, since it has already been shown that the proportion of infants of low birth weight was highest in the low socioeconomic groups. The low birth weight of prematurely born infants is an intrinsic component of the syndrome that leads to their death.

However, the most striking relationship between infant mortality and socioeconomic class was evidenced by births falling within the boundaries of what could be considered the

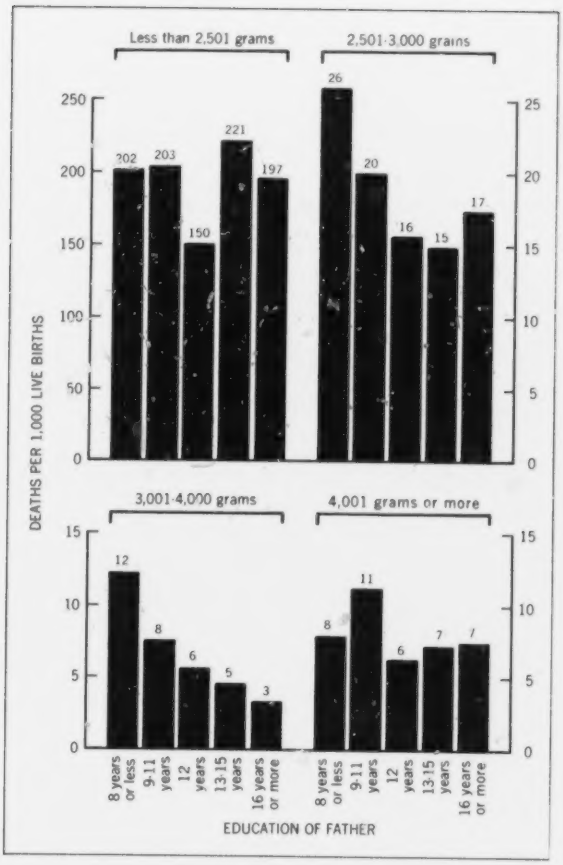

Figure 6. Estimated number of infant deaths per 1,000 white legitimate live births, by education of father and birth weight of infant.

most normal weight range—3,001 through 4,000 grams. For births in these weight groups, the range of mortality associated with variation in education of either parent was almost fourfold; in association with family income (table 22) the range was somewhat less. It is of further interest that for births within these weight groups a decline in mortality from the central to the highest socioeconomic class was seen—particularly in the data by education of father. This decline between the central and highest socioeconomic classes was not seen in the total population or in any other group of births examined. For infants weighing 3,001-4,000 grams at birth, the infant mortality rate was 40 percent lower for those whose fathers were college graduates than for those whose father's education terminated at the 12th grade.

COMMENT

The purpose of this study was not so much to uncover new relationships between risk of death and demographic characteristics as it was to identify and quantify such relationships for the United States—to determine to what extent the relationships that have been observed in other countries and in studies of limited populations in this country have relevance to this country as a whole.

In general, the relationships observed were similar to those that might have been expected on the basis of other work. There was a negative association between socioeconomic status and infant mortality, and this association was strongest for deaths occurring after the first week of life and was particularly marked for the largely infectious, respiratory and digestive diseases, and for accidents. There were, however, some findings which deserve comment.

Of some methodologic interest is the strong predictive value, with respect to infant mortality, exhibited by education of either parent, even within subcategories of family income. Some of the problems that may have attended the valid ascertainment of family income in this study have already been mentioned. However, it seems unlikely that these problems are limited to the methodology of this survey, and the data in this report confirm the advisability of seeking information on the education of both parents, as proposed in the 1968 Standard Certificate of Live Birth.[1]

The absence of a significant difference in overall mortality between infants in the three upper socioeconomic groups is of interest. This flattening of the trend has not been observed in British data, in which infant mortality continues to fall with socioeconomic status, from the highest to the lowest class.[2] A continuing decline of this type is seen in one group of births in the U.S. data—these are the births of normal (3,001-4,000 grams) birth weight (figure 6). However, deaths of infants in this birth weight group accounted for only 20 percent of all infant deaths—too small a proportion for the

continuing decline to be reflected in the data for all deaths.

Does this flattening of the trend imply that, to the extent that infant mortality is preventable in this country, the medical and other resources available to persons with a high school education and/or reported family income levels of $6,000 have attained the minimal rates achievable with existing knowledge? Consideration of the causes of death that make up the rate of about 19 per 1,000 in this group (table 14, 15, or 16) suggests that this point may indeed be close. However, two limitations of the present data must be kept in mind. First is the restriction to legitimate births; the effect of this restriction is problematic. Second is the restriction to deaths among liveborn infants. It is conceivable, for example, that superior medical care or some other concomitance of high socioeconomic status leads to a higher proportion of nonviable infants surviving the birth process than would be the case in less favorable circumstances. Such a situation would reduce the apparent slope of the relationship between mortality and socioeconomic status if only liveborn infants were considered. Data on late fetal deaths, comparable to those on postnatal deaths reported in this study, would assist in the interpretation of the present findings.

On the assumption that the number of deaths of infants in the lowest socioeconomic groups in excess of those expected on the basis of mortality rates in the highest socioeconomic group are, in a broad sense, preventable, estimates can be made of the proportion of infant deaths that would be prevented if all infants experienced the risks of the most favored socioeconomic groups.

For example, using education of father as the measure of socioeconomic status and considering as the minimum attainable the mortality rate of 17.4 per 1,000 observed among the infants of fathers in the highest educational class (table 2), it can be estimated that 47 percent of the deaths in the lowest socioeconomic group (with a rate of 33.0 per 1,000) were in excess of this minimum and were therefore, in a broad sense, preventable. While this is a large proportion of the deaths in this group, the group constituted only 16 percent of all births. Taking the population of births as a whole, about 24 percent of all infant deaths were in excess of those expected on the basis of rates in the most favored socioeconomic class.

Similar estimates can be made for deaths separated according to age at death or according to birth weight. Because of the problem of confounding racial and other variables referred to earlier, these estimates will be made only for white infants. From the rates given in table 11, it is estimated that only 10 percent of the deaths under 7 days of age but 36 percent of deaths between 7 days and 1 year in white infants were in excess of the rates in the most favored educational group. From the data for white infants in table 20, it is estimated that only 6 percent of the deaths of infants weighing 3,000 grams or less but 47 percent of those weighing 3,001-4,000 grams were in excess of the number expected on the basis of rates in the highest educational group.

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Table 1. Estimated average annual number of legitimate live births and infant deaths per 1,000 live births, by race, sex, family income, and parental education: United States, 1964-66

Family income and parental education	All races		White		Black	
	Male	Female	Male	Female	Male	Female
	Number of live births in thousands					
All incomes and levels of education	1,794	1,688	1,557	1,459	212	200
Family income						
Under $3,000	352	339	239	228	106	100
$3,000-$4,999	408	373	348	322	52	45
$5,000-$6,999	446	444	410	401	32	37
$7,000-$9,999	382	333	362	317	17	11
$10,000 and over	206	199	197	191	6	7
Father's education						
8 years or less	287	283	216	217	64	60
9-11 years	376	358	315	290	57	62
12 years	664	599	592	535	65	56
13-15 years	216	206	197	187	18	15
16 years or more	251	242	237	231	9	8
Mother's education						
8 years or less	212	211	163	157	44	49
9-11 years	451	417	366	340	79	70
12 years	794	731	715	660	70	64
13-15 years	218	206	201	189	14	11
16 years or more	119	122	112	112	5	7
	Deaths per 1,000 live births					
All incomes	25.6	20.3	23.1	18.2	43.5	35.1
Family income						
Under $3,000	36.2	27.9	32.0	22.4	44.3	40.7
$3,000-$4,999	28.1	21.9	24.7	19.2	53.7	38.9
$5,000-$6,999	20.3	15.9	19.5	16.1	29.8	15.1
$7,000-$9,999	21.3	18.2	20.8	17.4	•	•
$10,000 and over	22.1	17.6	21.4	17.4	•	•
Father's education						
8 years or less	36.3	29.7	33.8	26.8	44.7	39.9
9-11 years	29.6	25.1	24.8	22.8	55.3	35.3
12 years	21.6	16.2	20.1	14.8	34.9	28.9
13-15 years	23.4	17.8	22.1	15.8	•	•
16 years or more	20.2	14.5	19.7	14.2	•	•
Mother's education						
8 years or less	37.6	32.9	34.8	29.2	48.0	44.0
9-11 years	31.0	24.2	27.2	21.8	47.2	35.6
12 years	22.6	16.1	20.8	14.9	41.1	27.2
13-15 years	14.9	16.9	14.6	15.3	•	•
16 years or more	24.0	16.0	23.2	16.0	•	•

Table 2. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education of father, race, and family income: United States, 1964-66

Race of infant and family income	Education of father					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
	Number of live births in thousands					
All races						
All incomes	3,482	570	734	1,263	422	493
Under $3,000	691	250	203	167	44	26
$3,000-$4,999	780	152	211	305	73	39
$5,000-$6,999	890	104	181	389	126	90
$7,000-$9,999	716	46	106	297	117	150
$10,000 and over	406	18	33	105	62	187
White						
All incomes	3,016	433	604	1,127	384	468
Under $3,000	467	156	132	125	33	22
$3,000-$4,999	671	128	183	261	63	36
$5,000-$6,999	811	92	158	358	117	85
$7,000-$9,999	679	40	100	284	111	145
$10,000 and over	388	16	32	100	59	180
Black						
All incomes	413	124	119	121	32	16
Under $3,000	206	87	66	39	10	*
$3,000-$4,999	97	21	25	41	9	*
$5,000-$6,999	69	10	22	26	6	*
$7,000-$9,999	28	*	6	10	5	*
$10,000 and over	12	*	*	*	*	*
	Deaths per 1,000 live births					
All races						
All incomes	23.0	33.0	27.4	19.0	20.6	17.4
Under $3,000	32.1	36.2	34.3	28.3	26.8	9.9
$3,000-$4,999	25.1	33.5	27.6	21.1	20.5	19.7
$5,000-$6,999	18.1	26.4	22.4	15.4	16.2	14.5
$7,000-$9,999	19.9	29.3	22.4	17.8	22.7	17.1
$10,000 and over	19.9	*	26.9	15.3	21.4	19.5
White						
All incomes	20.8	30.3	23.9	17.6	19.0	17.0
Under $3,000	27.3	34.0	25.6	25.1	23.3	*
$3,000-$4,999	22.1	30.3	24.2	18.4	18.1	15.3
$5,000-$6,999	17.8	25.9	23.3	15.6	14.6	13.0
$7,000-$9,999	19.2	24.8	22.1	16.8	22.9	17.4
$10,000 and over	19.4	*	23.1	15.3	19.2	19.8
Black						
All incomes	39.5	42.4	44.8	32.2	37.6	*
Under $3,000	42.5	40.5	52.1	35.0	*	*
$3,000-$4,999	46.8	*	51.6	40.3	*	*
$5,000-$6,999	22.0	*	*	15.0	*	*
$7,000-$9,999	37.6	*	*	*	*	*
$10,000 and over	31.5	*	*	*	*	*

Table 3. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education of mother, race, and family income: United States, 1964-66

Race of infant and family income	Education of mother					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
	Number of live births in thousands					
All races						
All incomes	3,482	423	868	1,525	425	241
Under $3,000	691	194	260	192	34	11
$3,000-$4,999	780	118	249	328	66	20
$5,000-$6,999	890	68	208	464	110	40
$7,000-$9,999	716	35	113	375	118	75
$10,000 and over	406	9	37	166	98	96
White						
All incomes	3,016	320	706	1,375	391	224
Under $3,000	467	121	172	138	28	9
$3,000-$4,999	671	101	211	286	57	17
$5,000-$6,999	811	59	153	432	101	36
$7,000-$9,999	679	32	105	360	111	71
$10,000 and over	388	7	35	159	95	92
Black						
All incomes	413	93	148	134	26	12
Under $3,000	206	67	83	48	5	*
$3,000-$4,999	97	15	34	39	7	*
$5,000-$6,999	69	7	23	29	6	*
$7,000-$9,999	28	*	6	11	5	*
$10,000 and over	12	*	*	5	*	*
	Deaths per 1,000 live births					
All races						
All incomes	23.0	35.2	27.7	19.5	15.9	20.0
Under $3,000	32.1	37.3	37.2	24.5	14.3	*
$3,000-$4,999	25.1	38.4	26.6	19.6	23.4	*
$5,000-$6,999	18.1	29.9	21.7	16.9	10.4	14.0
$7,000-$9,999	19.9	23.3	21.4	20.2	16.1	20.0
$10,000 and over	19.9	*	21.9	18.8	17.2	22.5
White						
All incomes	20.8	32.0	24.6	18.0	15.0	19.6
Under $3,000	27.3	34.8	30.4	19.8	17.4	*
$3,000-$4,999	22.1	31.9	24.8	17.5	20.2	*
$5,000-$6,999	17.8	31.5	21.6	16.4	9.8	15.6
$7,000-$9,999	19.2	20.8	20.8	19.8	14.3	20.5
$10,000 and over	19.4	*	21.9	17.4	17.3	22.4
Black						
All incomes	39.5	45.9	41.7	34.5	32.1	*
Under $3,000	42.5	42.3	49.9	36.5	*	*
$3,000-$4,999	46.8	*	39.5	35.4	*	*
$5,000-$6,999	22.0	*	*	25.1	*	*
$7,000-$9,999	37.6	*	*	*	*	*
$10,000 and over	*	*	*	*	*	*

Table 4. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education of father, race, and education of mother: United States, 1964-66

Race of infant and education of mother	Education of father					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
	Number of live births in thousands					
All races						
All levels	3,482	570	734	1,263	422	493
8 years or less	423	245	92	75	10	*
9-11 years	868	181	332	289	50	16
12 years	1,525	132	282	761	216	135
13-15 years	425	11	27	113	110	163
16 years or more	241	*	*	26	36	177
White						
All levels	3,016	433	604	1,127	384	468
8 years or less	320	176	71	63	8	*
9-11 years	706	134	269	248	43	14
12 years	1,375	111	240	695	200	129
13-15 years	391	10	23	101	101	156
16 years or more	224	*	*	21	33	168
Black						
All levels	413	124	119	121	32	16
8 years or less	93	61	19	11	*	*
9-11 years	148	44	58	37	7	*
12 years	134	17	39	60	14	*
13-15 years	26	*	*	10	7	5
16 years or more	12	*	*	*	*	6
	Deaths per 1,000 live births					
All races						
All levels	23.0	33.0	27.4	19.0	20.6	17.4
8 years or less	35.2	39.8	39.4	18.2	*	*
9-11 years	27.7	32.7	27.1	25.7	31.1	*
12 years	19.5	21.1	25.0	17.4	19.7	17.4
13-15 years	15.9	*	15.5	14.2	19.9	13.7
16 years or more	20.0	*	*	16.4	15.3	21.2
White						
All levels	20.8	30.3	23.9	17.6	19.0	17.0
8 years or less	32.0	37.5	33.1	18.1	*	*
9-11 years	24.6	31.1	23.0	23.8	24.2	*
12 years	18.0	18.4	23.0	16.1	19.1	16.5
13-15 years	15.0	*	*	12.5	18.1	14.1
16 years or more	19.6	*	*	*	15.6	20.7
Black						
All levels	39.5	42.4	44.8	32.2	37.6	*
8 years or less	45.9	46.2	*	*	*	*
9-11 years	41.7	36.6	45.6	34.8	*	*
12 years	34.5	*	37.8	31.9	*	*
13-15 years	32.1	*	*	*	*	*
16 years or more	*	*	*	*	*	*

Table 5. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education of father, race, and age of mother: United States, 1964-66

Race of infant and age of mother	Education of father					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
	Number of live births in thousands					
All races						
All ages	3,482	570	734	1,263	422	493
Under 20 years	475	81	160	186	42	6
20-24 years	1,258	142	267	519	189	141
25-29 years	893	133	165	303	105	188
30-34 years	507	114	84	156	47	105
35 years and over	350	99	59	100	39	53
White						
All ages	3,016	433	604	1,127	384	468
Under 20 years	398	69	127	162	36	*
20-24 years	1,099	109	225	455	174	135
25-29 years	784	100	131	276	98	180
30-34 years	436	83	71	142	43	99
35 years and over	298	72	51	92	34	50
Black						
All ages	413	124	119	121	32	16
Under 20 years	72	11	31	23	6	*
20-24 years	140	31	37	56	11	5
25-29 years	93	29	31	23	6	*
30-34 years	61	28	13	12	*	*
35 years and over	47	25	8	6	5	*
	Deaths per 1,000 live births					
All races						
All ages	23.0	33.0	27.4	19.0	20.6	17.4
Under 20 years	29.8	41.4	31.3	25.1	25.0	*
20-24 years	20.5	34.0	22.9	18.5	17.8	13.5
25-29 years	21.5	29.3	27.5	18.6	21.3	15.4
30-34 years	22.9	27.4	26.5	16.3	26.4	23.5
35 years and over	27.0	36.2	38.1	16.2	21.1	22.2
White						
All ages	20.8	30.3	23.9	17.6	19.0	17.0
Under 20 years	25.2	35.4	23.2	22.9	24.2	*
20-24 years	18.9	34.2	20.4	17.5	16.3	11.9
25-29 years	19.1	25.5	26.7	16.1	19.1	14.9
30-34 years	21.4	23.7	25.0	15.7	23.2	24.4
35 years and over	24.9	33.8	31.8	16.0	22.1	23.6
Black						
All ages	39.5	42.4	44.8	32.2	37.6	*
Under 20 years	55.0	*	63.5	*	*	*
20-24 years	34.1	34.7	38.8	27.1	*	*
25-29 years	41.5	44.4	31.7	*	*	*
30-34 years	31.8	34.6	*	*	*	*
35 years and over	37.5	41.0	*	*	*	*

Table 6. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education, race, and age of mother: United States, 1964-66

Race of infant and age of mother	Education of mother					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
All races	Number of live births in thousands					
All ages	3,482	423	868	1,525	425	241
Under 20 years	475	69	237	154	15	*
20-24 years	1,258	101	288	640	171	58
25-29 years	893	97	172	394	128	102
30-34 years	507	84	98	198	72	54
35 years and over	350	72	73	139	39	27
White						
All ages	3,016	320	706	1,375	391	224
Under 20 years	398	55	195	136	11	*
20-24 years	1,099	78	234	577	157	53
25-29 years	784	70	141	356	119	98
30-34 years	436	62	79	178	68	49
35 years and over	298	55	57	127	35	24
Black						
All ages	413	93	148	134	26	12
Under 20 years	72	14	39	17	*	*
20-24 years	140	21	48	54	12	*
25-29 years	93	23	28	34	6	*
30-34 years	61	20	18	17	*	*
35 years and over	47	15	15	12	*	*
All races	Deaths per 1,000 live births					
All ages	23.0	35.2	27.7	19.5	15.9	20.0
Under 20 years	29.8	37.9	31.8	24.0	*	*
20-24 years	20.5	37.1	24.3	18.2	15.2	14.4
25-29 years	21.5	31.6	28.6	19.1	14.2	18.0
30-34 years	22.9	26.0	25.3	20.9	17.9	27.7
35 years and over	27.0	45.6	29.3	19.2	18.1	24.3
White						
All ages	20.8	32.0	24.6	18.0	15.0	19.6
Under 20 years	25.2	29.1	25.3	23.7	*	*
20-24 years	18.9	36.3	23.7	16.6	14.1	11.1
25-29 years	19.1	28.9	24.7	17.4	13.0	18.0
30-34 years	21.4	26.8	21.8	19.3	16.6	28.4
35 years and over	24.9	38.9	29.6	18.0	18.9	*
Black						
All ages	39.5	45.9	41.7	34.5	32.1	*
Under 20 years	55.0	*	63.7	*	*	*
20-24 years	34.1	*	28.7	34.5	*	*
25-29 years	41.5	*	46.2	37.8	*	*
30-34 years	31.8	*	*	*	*	*
35 years and over	37.5	*	*	*	*	*

Table 7. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by family income, race, and age of mother: United States, 1964-66

Race of infant and age of mother	Family income					
	All incomes	Under $3,000	$3,000-$4,999	$5,000-$6,999	$7,000-$9,999	$10,000 and over
	Number of live births in thousands					
All races						
All ages	3,482	690	780	890	715	406
Under 20 years	475	220	142	80	25	9
20-24 years	1,258	243	324	379	227	85
25-29 years	893	113	166	233	250	131
30-34 years	507	65	95	116	129	102
35 years and over	350	49	65	82	85	79
White						
All ages	3,016	467	671	811	679	388
Under 20 years	398	166	129	73	22	7
20-24 years	1,099	169	282	350	216	81
25-29 years	784	69	139	214	238	125
30-34 years	436	34	77	104	122	100
35 years and over	298	29	43	71	81	74
Black						
All ages	413	206	97	69	28	12
Under 20 years	72	51	12	6	*	*
20-24 years	140	68	38	25	8	*
25-29 years	93	40	23	17	9	*
30-34 years	61	28	14	11	5	*
35 years and over	47	19	11	10	*	*
	Deaths per 1,000 live births					
All races						
All ages	23.0	32.1	25.1	18.1	19.9	19.9
Under 20 years	29.8	31.7	24.8	22.4	49.9	*
20-24 years	20.5	28.9	25.2	14.9	15.5	17.2
25-29 years	21.5	32.4	25.3	19.6	18.3	16.6
30-34 years	22.9	35.3	19.6	21.1	21.9	21.4
35 years and over	27.0	45.4	34.7	20.6	24.1	20.1
White						
All ages	20.8	27.3	22.1	17.8	19.2	19.4
Under 20 years	25.2	24.4	21.0	22.5	*	*
20-24 years	18.9	26.8	22.5	15.0	14.9	17.1
25-29 years	19.1	23.5	21.7	19.5	17.5	16.4
30-34 years	21.4	38.2	18.1	18.5	22.5	20.1
35 years and over	24.9	43.8	30.4	21.3	23.3	19.7
Black						
All ages	39.5	42.5	46.8	22.0	37.6	*
Under 20 years	55.0	55.0	*	*	*	*
20-24 years	34.1	33.8	47.5	14.6	*	*
25-29 years	41.5	46.0	*	*	*	*
30-34 years	31.8	31.5	*	*	*	*
35 years and over	37.5	*	*	*	*	*

Table 8. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education of father, race of infant, geographic region, and metropolitan or nonmetropolitan county: United States, 1964-66

Race, region, and metropolitan or nonmetropolitan county	Education of father					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
All races	Number of live births in thousands					
All regions	3,482	570	734	1,263	422	493
Metropolitan	2,241	290	489	798	299	366
Nonmetropolitan	1,241	280	246	465	123	127
Northeast	816	106	184	294	92	141
Metropolitan	654	81	150	230	77	117
Nonmetropolitan	162	25	34	64	15	24
North Central	992	130	203	408	120	132
Metropolitan	614	70	140	231	82	91
Nonmetropolitan	378	60	63	177	37	41
South	1,092	260	227	357	112	136
Metropolitan	548	91	110	193	65	90
Nonmetropolitan	544	169	117	164	48	46
West	581	73	121	204	98	84
Metropolitan	424	48	89	144	76	68
Nonmetropolitan	157	26	32	60	23	16
White						
All regions	3,016	433	604	1,127	384	468
Metropolitan	1,920	217	397	693	268	345
Nonmetropolitan	1,096	215	208	434	115	123
Northeast	735	91	156	266	87	135
Metropolitan	577	67	124	202	72	112
Nonmetropolitan	158	24	32	64	15	23
North Central	912	112	175	384	112	129
Metropolitan	540	52	115	210	75	88
Nonmetropolitan	372	59	61	174	37	41

Table 8. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education of father, race of infant, geographic region, and metropolitan or nonmetropolitan county: United States, 1964-66—Con.

Race, region, and metropolitan or nonmetropolitan county	Education of father					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
White—Con.	Number of live births in thousands					
South	857	171	167	297	97	125
Metropolitan	432	61	79	156	56	82
Nonmetropolitan	425	111	88	142	41	44
West	511	58	107	180	88	79
Metropolitan	371	37	79	125	66	64
Nonmetropolitan	141	21	28	55	22	15
Black						
All regions	413	124	119	121	32	16
Metropolitan	285	64	87	94	26	14
Nonmetropolitan	128	60	32	27	6	•
Northeast	74	13	27	26	•	•
Metropolitan	71	12	25	26	•	•
Nonmetropolitan	•	•	•	•	•	•
North Central	75	18	26	22	7	•
Metropolitan	71	17	25	20	7	•
Nonmetropolitan	•	•	•	•	•	•
South	230	87	60	59	15	10
Metropolitan	113	30	31	37	9	8
Nonmetropolitan	117	57	29	22	6	•
West	33	6	7	13	6	•
Metropolitan	30	6	6	11	6	•
Nonmetropolitan	•	•	•	•	•	•

Table 8. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education of father, race of infant, geographic region, and metropolitan or nonmetropolitan county: United States, 1964-66—Con.

Race, region, and metropolitan or nonmetropolitan county	Education of father					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
All races	Deaths per 1,000 live births					
All regions	23.0	33.0	27.4	19.0	20.6	17.4
Metropolitan	22.0	32.0	25.0	19.4	21.0	16.7
Nonmetropolitan	24.9	34.1	32.0	18.4	19.7	19.1
Northeast	20.4	25.3	25.3	18.2	18.3	16.3
Metropolitan	20.0	27.3	22.9	17.9	18.1	16.4
Nonmetropolitan	22.0	18.8	36.0	18.9	*	*
North Central	23.3	32.1	29.0	18.8	24.3	13.0
Metropolitan	24.1	37.4	26.5	20.4	26.5	17.1
Nonmetropolitan	22.1	25.8	34.7	16.6	19.6	23.4
South	25.7	38.8	31.0	19.3	15.7	16.8
Metropolitan	24.3	38.0	30.4	19.8	17.7	17.6
Nonmetropolitan	27.0	39.2	31.6	18.6	13.1	15.3
West	21.3	25.4	21.1	20.3	24.0	17.5
Metropolitan	19.3	20.4	20.0	19.3	21.0	15.8
Nonmetropolitan	26.9	34.8	24.4	22.8	*	*
White						
All regions	20.8	30.3	23.9	17.6	19.0	17.0
Metropolitan	20.0	30.7	21.7	17.8	19.3	16.4
Nonmetropolitan	22.0	29.9	27.9	17.3	18.4	18.5
Northeast	19.1	23.7	23.0	17.6	16.0	16.4
Metropolitan	18.5	26.2	19.4	17.4	15.4	16.9
Nonmetropolitan	21.3	*	37.0	18.5	*	*
North Central	21.7	29.7	27.6	17.4	22.7	18.3
Metropolitan	21.8	36.4	23.9	18.3	24.3	16.3
Nonmetropolitan	21.5	23.7	34.5	16.4	19.6	22.6

Table 8. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education of father, race of infant, geographic region, and metropolitan or nonmetropolitan county: United States, 1964-66—Con.

Race, region, and metropolitan or nonmetropolitan county	Education of father					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
White—Con.	Deaths per 1,000 live births					
South	21.7	36.0	25.0	17.0	13.5	15.1
Metropolitan	21.3	35.7	28.2	17.1	15.7	15.5
Nonmetropolitan	22.1	36.1	22.2	16.8	10.6	14.3
West	19.9	25.2	17.2	18.8	23.4	18.6
Metropolitan	18.4	22.7	15.7	18.2	21.1	16.8
Nonmetropolitan	24.0	*	21.3	20.1	*	*
Black						
All regions	39.5	42.4	44.8	32.2	37.6	*
Metropolitan	36.9	39.0	40.5	32.0	39.3	*
Nonmetropolitan	45.1	46.0	56.3	32.7	*	*
Northeast	33.8	*	38.0	24.5	*	*
Metropolitan	33.2	*	39.5	23.4	*	*
Nonmetropolitan	*	*	*	*	*	*
North Central	43.8	*	38.8	*	*	*
Metropolitan	42.8	*	38.2	*	*	*
Nonmetropolitan	*	*	*	*	*	*
South	40.5	44.3	47.1	31.2	*	*
Metropolitan	35.8	41.7	36.1	31.8	*	*
Nonmetropolitan	45.0	45.7	58.7	*	*	*
West	35.2	*	*	*	*	*
Metropolitan	35.9	*	*	*	*	*
Nonmetropolitan	*	*	*	*	*	*

Table 9. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education of mother, race of infant, geographic region, and metropolitan or nonmetropolitan county: United States, 1964-66

Race, region, and metropolitan or nonmetropolitan county	Education of mother					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
All races	Number of live births in thousands					
All regions	3,482	423	868	1,525	425	241
Metropolitan	2,241	219	561	991	294	176
Nonmetropolitan	1,241	204	307	534	130	65
Northeast	816	77	192	394	88	66
Metropolitan	654	62	155	317	67	117
Nonmetropolitan	162	15	37	76	21	12
North Central	992	80	234	492	120	66
Metropolitan	614	45	155	291	79	44
Nonmetropolitan	378	35	79	201	41	22
South	1,092	209	307	387	118	68
Metropolitan	548	74	152	207	72	44
Nonmetropolitan	544	136	156	182	46	24
West	581	57	135	250	98	41
Metropolitan	424	39	100	176	76	34
Nonmetropolitan	157	18	35	75	22	7
White						
All regions	3,016	320	706	1,375	391	224
Metropolitan	1,920	167	452	874	265	162
Nonmetropolitan	1,096	152	254	500	126	63
Northeast	735	65	163	361	83	64
Metropolitan	577	50	128	285	63	51
Nonmetropolitan	158	15	35	76	20	12
North Central	912	68	201	466	112	64
Metropolitan	540	35	124	267	71	43
Nonmetropolitan	372	32	77	200	41	22

Table 9. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education of mother, race of infant, geographic region, and metropolitan or nonmetropolitan county: United States, 1964-66—Con.

Race, region, and metropolitan or nonmetropolitan county	Education of mother					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
White—Con.	Number of live births in thousands					
South	857	142	225	323	107	60
Metropolitan	432	52	114	166	63	37
Nonmetropolitan	425	90	111	157	43	22
West	511	45	117	224	88	37
Metropolitan	371	30	86	156	67	30
Nonmetropolitan	141	15	31	68	21	6
Black						
All regions	413	93	148	134	26	12
Metropolitan	285	46	101	105	22	11
Nonmetropolitan	128	47	47	29	*	*
Northeast	74	11	27	31	*	*
Metropolitan	71	10	25	31	*	*
Nonmetropolitan	*	*	*	*	*	*
North Central	75	10	31	25	7	*
Metropolitan	71	9	30	24	7	*
Nonmetropolitan	*	*	*	*	*	*
South	230	66	81	64	11	8
Metropolitan	113	22	38	40	8	6
Nonmetropolitan	117	44	44	25	*	*
West	33	5	9	14	*	*
Metropolitan	30	5	8	11	*	*
Nonmetropolitan	*	*	*	*	*	*

Table 9. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education of mother, race of infant, geographic region, and metropolitan or nonmetropolitan county: United States, 1964-66—Con.

Race, region, and metropolitan or nonmetropolitan county	Education of mother					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
	Deaths per 1,000 live births					
All races						
All regions	23.0	35.2	27.7	19.5	15.9	20.0
Metropolitan	22.0	32.0	25.2	20.0	16.0	21.1
Nonmetropolitan	24.9	38.7	32.3	18.5	15.7	17.0
Northeast	20.4	23.8	24.9	18.9	13.0	21.7
Metropolitan	20.0	23.2	22.7	19.0	13.7	21.8
Nonmetropolitan	22.0	*	33.8	18.6	*	*
North Central	23.3	38.2	28.2	20.3	18.2	19.5
Metropolitan	24.1	33.5	29.1	21.8	18.3	22.4
Nonmetropolitan	22.1	44.2	26.7	18.2	17.9	*
South	25.7	40.9	29.9	19.5	12.9	17.4
Metropolitan	24.3	44.6	25.5	20.8	14.5	19.2
Nonmetropolitan	27.0	38.9	34.2	18.1	10.4	*
West	21.3	25.5	25.9	18.5	19.2	22.4
Metropolitan	19.3	20.2	22.8	17.8	16.9	20.7
Nonmetropolitan	26.9	*	34.7	20.2	*	*
White						
All regions	20.8	32.0	24.6	18.0	15.0	19.6
Metropolitan	20.0	30.0	22.2	18.4	14.8	21.1
Nonmetropolitan	22.0	34.2	28.9	17.3	15.3	15.8
Northeast	19.1	21.6	23.7	17.7	12.8	21.3
Metropolitan	18.5	20.7	20.9	17.5	13.4	22.0
Nonmetropolitan	21.3	*	34.0	18.2	*	*
North Central	21.7	39.1	25.9	18.8	17.0	18.9
Metropolitan	21.8	34.1	26.1	19.6	16.5	21.5
Nonmetropolitan	21.5	44.6	25.7	17.7	17.9	*

Table 9. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by education of mother, race of infant, geographic region, and metropolitan or nonmetropolitan county: United States, 1964-66—Con.

Race, region, and metropolitan or nonmetropolitan county	Education of mother					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
White—Con.	Deaths per 1,000 live births					
South	21.7	35.8	25.2	17.5	11.6	15.3
Metropolitan	21.3	40.4	21.4	19.3	12.6	17.6
Nonmetropolitan	22.1	33.2	29.0	15.6	10.1	•
West	19.9	24.6	22.6	17.5	18.4	25.0
Metropolitan	18.4	23.1	19.5	16.9	16.4	23.0
Nonmetropolitan	24.0	•	31.1	18.8	•	•
Black						
All regions	39.5	45.9	41.7	34.5	32.1	•
Metropolitan	36.9	42.0	38.7	34.2	•	•
Nonmetropolitan	45.1	49.7	48.1	35.6	•	•
Northeast	33.8	•	32.5	34.3	•	•
Metropolitan	33.2	•	32.6	33.8	•	•
Nonmetropolitan	•	•	•	•	•	•
North Central	43.8	•	44.7	48.8	•	•
Metropolitan	42.8	•	42.0	•	•	•
Nonmetropolitan	•	•	•	•	•	•
South	40.5	51.0	43.3	29.1	•	•
Metropolitan	35.8	•	38.0	26.2	•	•
Nonmetropolitan	45.0	50.1	48.0	33.6	•	•
West	35.2	•	•	•	•	•
Metropolitan	35.9	•	•	•	•	•
Nonmetropolitan	•	•	•	•	•	•

Table 10. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by family income, race of infant, geographic region, and metropolitan or nonmetropolitan county: United States, 1964-66

Race, region, and metropolitan or nonmetropolitan county	Family income					
	All incomes	Under $3,000	$3,000-$4,999	$5,000-$6,999	$7,000-$9,999	$10,000 and over
	Number of live births in thousands					
All races						
All regions	3,482	691	780	890	716	406
Metropolitan	2,241	371	458	585	515	313
Nonmetropolitan	1,241	320	323	305	200	93
Northeast	816	109	173	232	185	117
Metropolitan	654	83	134	187	151	99
Nonmetropolitan	162	26	39	45	35	18
North Central	992	139	203	280	255	115
Metropolitan	614	79	103	175	176	82
Nonmetropolitan	378	60	100	105	80	33
South	1,092	332	286	228	155	90
Metropolitan	548	132	140	118	95	63
Nonmetropolitan	544	200	146	109	60	28
West	581	111	118	149	120	84
Metropolitan	424	77	80	104	94	69
Nonmetropolitan	157	33	38	46	26	15
White						
All regions	3,016	467	671	811	679	388
Metropolitan	1,920	246	376	518	483	297
Nonmetropolitan	1,096	222	294	292	197	91
Northeast	735	78	153	214	178	113
Metropolitan	577	55	115	169	143	96
Nonmetropolitan	158	23	38	44	35	18
North Central	912	111	185	261	243	111
Metropolitan	540	54	86	156	164	79
Nonmetropolitan	372	57	99	104	79	33

Table 10. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by family income, race of infant, geographic region, and metropolitan or nonmetropolitan county: United States, 1964-66—Con.

Race, region, and metropolitan or nonmetropolitan county	Family income					
	All incomes	Under $3,000	$3,000-$4,999	$5,000-$6,999	$7,000-$9,999	$10,000 and over
White—Con.	Number of live births in thousands					
South	857	189	235	202	147	85
Metropolitan	432	73	110	103	88	58
Nonmetropolitan	425	116	125	99	58	26
West	511	88	98	135	112	79
Metropolitan	371	64	65	90	87	65
Nonmetropolitan	141	25	33	44	25	14
Black						
All regions	413	206	97	69	28	12
Metropolitan	285	119	72	57	26	11
Nonmetropolitan	128	87	25	12	*	*
Northeast	74	29	19	17	6	*
Metropolitan	71	27	18	16	6	*
Nonmetropolitan	*	*	*	*	*	*
North Central	75	25	18	17	12	*
Metropolitan	71	23	17	17	11	*
Nonmetropolitan	*	*	*	*	*	*
South	230	140	51	26	8	5
Metropolitan	113	58	29	16	6	*
Nonmetropolitan	117	82	21	10	*	*
West	33	11	10	9	*	*
Metropolitan	30	10	8	8	*	*
Nonmetropolitan	*	*	*	*	*	*

Table 10. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by family income, race of infant, geographic region, and metropolitan or nonmetropolitan county: United States, 1964-66—Con.

Race, region, and metropolitan or nonmetropolitan county	Family income					
	All incomes	Under $3,000	$3,000-$4,999	$5,000-$6,999	$7,000-$9,999	$10,000 and over
All races	Deaths per 1,000 live births					
All regions	23.0	32.1	25.1	18.1	19.9	19.9
Metropolitan	22.0	29.8	25.8	17.5	20.2	18.8
Nonmetropolitan	24.9	34.8	24.2	19.3	19.0	23.7
Northeast	20.4	23.2	21.2	16.5	22.5	20.8
Metropolitan	20.0	23.7	20.6	15.8	22.0	20.8
Nonmetropolitan	22.0	21.6	23.6	19.5	24.3	20.7
North Central	23.3	32.5	26.0	20.5	19.5	22.7
Metropolitan	24.1	36.2	30.2	19.1	20.9	22.0
Nonmetropolitan	22.1	27.6	21.8	22.7	16.6	24.4
South	25.7	36.9	28.0	15.7	18.3	15.0
Metropolitan	24.3	35.4	30.6	16.2	16.9	13.4
Nonmetropolitan	27.0	37.8	25.5	15.2	20.5	18.5
West	21.3	26.3	22.4	19.8	18.5	20.1
Metropolitan	19.3	20.2	20.5	19.3	19.3	16.9
Nonmetropolitan	26.9	40.2	26.5	21.1	15.6	35.5
White						
All regions	20.8	27.3	22.1	17.8	19.2	19.4
Metropolitan	20.0	25.1	22.5	17.1	19.6	18.4
Nonmetropolitan	22.0	29.8	21.5	19.0	18.2	22.6
Northeast	19.1	23.1	18.3	15.8	21.7	19.8
Metropolitan	18.5	22.9	16.9	15.0	21.3	20.0
Nonmetropolitan	21.3	*	22.3	18.9	23.2	*
North Central	21.7	29.2	22.8	19.9	19.1	21.9
Metropolitan	21.8	30.0	26.9	18.2	20.2	20.8
Nonmetropolitan	21.5	28.4	19.2	22.4	16.8	24.6

Table 10. Estimated average annual number of legitimate live births and of infant deaths per 1,000 live births, by family income, race of infant, geographic region, and metropolitan or nonmetropolitan county: United States, 1964-66—Con.

Race, region, and metropolitan or nonmetropolitan county	Family income					
	All incomes	Under $3,000	$3,000-$4,999	$5,000-$6,999	$7,000-$9,999	$10,000 and over
White—Con.	Deaths per 1,000 live births					
South	21.7	30.7	24.0	16.5	17.3	15.0
Metropolitan	21.3	30.5	26.3	17.5	16.5	14.4
Nonmetropolitan	22.1	30.8	22.1	15.5	18.5	16.5
West	19.9	21.6	21.8	19.0	18.0	20.1
Metropolitan	18.4	16.7	19.9	19.0	18.9	17.0
Nonmetropolitan	24.0	34.1	25.6	19.1	14.7	*
Black						
All regions	39.5	42.5	46.8	22.0	37.6	*
Metropolitan	36.9	39.5	46.0	23.0	33.5	*
Nonmetropolitan	45.1	46.7	49.1	*	*	*
Northeast	33.8	24.5	*	*	*	*
Metropolitan	33.2	26.2	*	*	*	*
Nonmetropolitan	*	*	*	*	*	*
North Central	43.8	50.2	*	*	*	*
Metropolitan	42.8	*	*	*	*	*
Nonmetropolitan	*	*	*	*	*	*
South	40.5	45.0	46.8	9.7	*	*
Metropolitan	35.8	40.7	47.8	*	*	*
Nonmetropolitan	45.0	48.1	*	*	*	*
West	35.2	*	*	*	*	*
Metropolitan	35.9	*	*	*	*	*
Nonmetropolitan	*	*	*	*	*	*

Table 11. Estimated infant deaths per 1,000 legitimate live births, by education of father and infant's race and age at death: United States, 1964-66

Race and age at death	Education of father					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
	Deaths per 1,000 live births					
All races						
Less than 1 year	23.0	33.0	27.4	19.0	20.6	17.4
Less than 1 day	9.8	12.0	10.5	8.5	10.5	8.6
1-6 days	5.6	6.6	6.7	4.9	5.4	4.8
7-27 days	1.7	3.2	2.1	1.2	1.1	0.8
1-5 months	4.3	8.0	5.3	3.4	2.5	2.5
6-11 months	1.7	3.2	2.8	1.1	1.2	0.7
White						
Less than 1 year	20.8	30.3	23.9	17.6	19.0	17.0
Less than 1 day	9.1	11.0	10.2	8.0	9.9	8.1
1-6 days	5.3	6.8	5.7	4.7	4.9	4.8
7-27 days	1.4	2.8	1.7	1.0	1.1	0.9
1-5 months	3.5	6.9	4.0	3.0	2.0	2.4
6-11 months	1.5	2.8	2.3	0.9	1.1	0.8
Black						
Less than 1 year	39.5	42.4	44.8		33.5	
Less than 1 day	14.7	15.7	12.1		15.8	
1-6 days	8.3	6.6	12.0		7.0	
7-27 days	3.7	4.8	4.5		2.3	
1-5 months	9.9	11.9	11.7		7.1	
6-11 months	2.9	3.5	4.6		1.3	

Table 12. Estimated infant deaths per 1,000 legitimate live births, by education of mother and infant's race and age at death: United States, 1964-66

Race and age at death	Education of mother					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
	Deaths per 1,000 live births					
All races						
Less than 1 year	23.0	35.2	27.7	19.5	15.9	20.0
Less than 1 day	9.8	12.4	11.2	8.9	7.0	10.3
1-6 days	5.6	7.0	6.3	5.1	4.8	5.1
7-27 days	1.7	3.6	2.2	1.2	0.5	1.1
1-5 months	4.3	8.1	6.0	2.9	2.7	2.6
6-11 months	1.7	4.1	2.1	1.3	0.9	0.9
White						
Less than 1 year	20.8	32.0	24.6	18.0	15.0	19.6
Less than 1 day	9.1	11.4	10.6	8.5	6.2	10.3
1-6 days	5.3	6.7	5.9	4.8	5.0	4.7
7-27 days	1.4	3.2	1.8	1.1	0.5	1.1
1-5 months	3.5	7.1	4.5	2.6	2.5	2.5
6-11 months	1.5	3.6	1.8	1.1	0.8	1.0
Black						
Less than 1 year	39.5	45.9	41.7		34.0	
Less than 1 day	14.7	16.9	13.1		14.9	
1-6 days	8.3	8.6	8.1		8.3	
7-27 days	3.7	4.9	4.4		2.4	
1-5 months	9.9	11.7	13.3		5.9	
6-11 months	2.9	3.8	2.8		2.5	

Table 13. Estimated infant deaths per 1,000 legitimate live births, by family income and infant's race and age at death: United States, 1964-66

Race and age at death	Family income					
	All incomes	Under $3,000	$3,000-$4,999	$5,000-$6,999	$7,000-$9,999	$10,000 and over
	Deaths per 1,000 live births					
All races						
Less than 1 year	23.0	32.1	25.1	18.1	19.9	19.9
Less than 1 day	9.8	11.3	11.0	8.2	8.7	10.1
1-6 days	5.6	7.0	5.7	4.6	5.3	5.7
7-27 days	1.7	3.0	1.5	1.1	1.5	1.1
1-5 months	4.3	8.1	4.6	3.1	3.1	2.0
6-11 months	1.7	2.8	2.3	1.2	1.3	1.0
White						
Less than 1 year	20.8	27.3	22.1	17.8	19.2	19.4
Less than 1 day	9.1	10.6	9.6	8.1	8.6	9.7
1-6 days	5.3	5.9	5.5	4.5	5.2	5.8
7-27 days	1.4	2.6	1.0	1.0	1.6	1.2
1-5 months	3.5	6.1	4.1	3.0	2.6	2.0
6-11 months	1.5	2.2	1.9	1.2	1.2	0.8
Black						
Less than 1 year	39.5	42.5	46.8		27.1	
Less than 1 day	14.7	13.4	21.7		10.9	
1-6 days	8.3	9.3	8.3		6.5	
7-27 days	3.7	4.2	5.4		1.1	
1-5 months	9.9	12.6	8.0		6.4	
6-11 months	2.9	3.0	3.5		2.1	

Table 14. Estimated infant deaths per 1,000 legitimate live births, by education of father, race, and cause of infant's death: United States, 1964-66

Cause of death (Seventh Revision of International Lists, 1955)	Race of infant and education of father											
	All races				White				Black			
	All levels	8 years or less	9-11 years	12 years or more	All levels	8 years or less	9-11 years	12 years or more	All levels	8 years or less	9-11 years	12 years or more
	Deaths per 1,000 live births											
All causes	23.0	33.0	27.4	19.0	20.8	30.3	23.9	17.7	39.5	42.4	44.8	33.5
Infective and parasitic diseases 001-138	0.2	0.3	0.4	0.1	0.1	0.3	0.3	0.1	0.3	0.3	0.7	0.0
Influenza, pneumonia, and all other diseases of respiratory system 470-475, 480-493, 500-527, 763	3.0	5.3	3.8	2.1	2.4	4.3	3.2	1.8	7.1	9.2	6.9	5.7
Gastritis, duodenitis, and all other diseases of digestive system 530-587	0.7	1.8	0.7	0.4	0.5	1.3	0.4	0.4	1.6	3.0	1.6	0.7
Congenital malformations 750-759	3.7	4.8	4.6	3.0	3.8	5.5	4.7	3.1	2.9	1.5	4.7	2.6
Birth injuries 760, 761	1.9	2.7	2.3	1.6	1.9	3.0	2.3	1.5	2.4	1.9	2.3	2.7
Postnatal asphyxia and atelectasis 762	3.8	5.1	4.1	3.4	3.5	4.7	3.5	3.2	6.5	6.9	7.5	5.5
Hemolytic disease of newborn (erythroblastosis) 770	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.2	0.0	0.0	0.5
Immaturity, unqualified 776	3.6	4.2	4.8	3.1	3.1	3.4	4.1	2.7	6.9	6.9	7.8	6.4
Certain diseases of early infancy[1] 765-769, 771-774	3.6	4.7	3.4	3.3	3.2	4.1	2.9	3.2	6.1	7.0	6.2	5.4
Accidents E800-E962	0.8	1.5	1.2	0.5	0.7	1.5	0.8	0.4	1.7	1.0	2.9	1.5
Residual 140-486, 590-747, 780-793, 795, E963-E985	1.5	2.4	1.8	1.1	1.2	1.9	1.3	1.0	3.8	4.7	4.3	2.7

[1] Includes neonatal disorders arising from certain diseases of the mother during pregnancy; ill-defined diseases peculiar to early infancy; immaturity with mention of other subsidiary condition; and other diseases peculiar to early infancy not already shown. Ill-defined diseases peculiar to early infancy account for about 60 percent of these deaths.

Table 15. Estimated infant deaths per 1,000 legitimate live births, by education of mother, race, and cause of infant's death: United States, 1964-66

Cause of death (Seventh Revision of International Lists, 1955)	Race of infant and education of mother											
	All races				White				Black			
	All levels	8 years or less	9-11 years	12 years or more	All levels	8 years or less	9-11 years	12 years or more	All levels	8 years or less	9-11 years	12 years or more
	Deaths per 1,000 live births											
All causes	23.0	35.2	27.7	18.8	20.8	32.0	24.6	17.6	39.5	45.9	41.7	34.0
Infective and parasitic diseases 001-138	0.2	0.3	0.3	0.1	0.1	0.3	0.3	0.1	0.3	0.0	0.5	0.2
Influenza, pneumonia, and all other diseases of respiratory system 470-475, 480-493, 500-527, 763	3.0	5.8	4.4	1.9	2.4	5.0	3.5	1.6	7.1	8.8	8.7	4.8
Gastritis, duodenitis, and all other diseases of digestive system 530-587	0.7	2.5	0.7	0.3	0.5	1.9	0.4	0.3	1.6	3.4	2.0	0.5
Congenital malformations 750-759	3.7	4.6	3.9	3.4	3.8	4.9	4.2	3.4	2.9	2.8	2.5	3.2
Birth injuries 760, 761	1.9	2.2	2.5	1.6	1.9	2.4	2.5	1.6	2.4	1.7	2.3	2.7
Postnatal asphyxia and atelectasis 762	3.8	6.3	4.3	3.2	3.5	5.7	3.9	3.0	6.5	8.8	6.3	5.3
Hemolytic disease of newborn (erythroblastosis) 770	0.4	0.3	0.5	0.4	0.4	0.4	0.5	0.4	0.2	0.0	0.2	0.3
Immaturity, unqualified 776	3.6	4.5	4.4	3.1	3.1	3.0	4.0	2.8	6.9	9.6	5.9	6.4
Certain diseases of early infancy[1] 765, 769, 771-774	3.6	5.1	4.1	3.1	3.2	4.9	3.7	2.8	6.1	6.4	5.8	6.2
Accidents E800-E962	0.8	1.5	1.0	0.6	0.7	1.7	0.7	0.5	1.7	0.4	2.1	2.1
Residual 140-486, 590-747, 780-793, 795, E963-E985	1.5	2.3	1.8	1.2	1.2	1.8	1.1	1.1	3.8	4.2	5.3	2.2

[1] Includes neonatal disorders arising from certain diseases of the mother during pregnancy; ill-defined diseases peculiar to early infancy; immaturity with mention of other subsidiary condition; and other diseases peculiar to early infancy not already shown. Ill-defined diseases peculiar to early infancy account for about 60 percent of these deaths.

Table 16. Estimated infant deaths per 1,000 legitimate live births, by family income, race, and cause of infant's death: United States, 1964-66

Cause of death (Seventh Revision of International Lists, 1955)	Race of infant and family income											
	All races				White				Black			
	All incomes	Under $3,000	$3,000-$4,999	$5,000 and over	All incomes	Under $3,000	$3,000-$4,999	$5,000 and over	All incomes	Under $3,000	$3,000-$4,999	$5,000 and over
	Deaths per 1,000 live births											
All causes	23.0	32.1	25.1	19.1	20.8	27.3	22.1	18.7	39.5	42.5	46.8	27.1
Infective and parasitic diseases 001-138	0.2	0.5	0.1	0.1	0.1	0.6	0.1	0.1	0.3	0.4	0.4	0.0
Influenza, pneumonia, and all other diseases of respiratory system 470-475, 480-493, 500-527, 763	3.0	5.5	3.4	2.0	2.4	4.3	3.0	1.8	7.1	8.0	7.1	5.5
Gastritis, duodenitis, and all other diseases of digestive system 530-587	0.7	1.5	0.8	0.4	0.5	1.2	0.4	0.4	1.6	1.6	2.7	0.7
Congenital malformations 750-759	3.7	3.9	3.9	3.5	3.8	4.4	3.8	3.6	2.9	2.8	4.4	1.7
Birth injuries 760, 761	1.9	1.7	2.7	1.7	1.9	1.5	2.3	1.8	2.4	1.9	5.5	0.4
Postnatal asphyxia and atelectasis 762	3.8	4.6	3.5	3.7	3.5	3.6	3.2	3.6	6.5	7.2	6.1	5.4
Hemolytic disease of newborn (erythroblastosis) 770	0.4	0.2	0.4	0.4	0.4	0.3	0.4	0.4	0.2	0.0	0.4	0.4
Immaturity, unqualified 776	3.6	5.2	4.3	2.8	3.1	4.5	3.3	2.7	6.9	6.7	10.4	4.4
Certain diseases of early infancy[1] 765, 769, 771-774	3.6	5.0	3.7	3.1	3.2	4.1	3.5	2.9	6.1	7.1	5.2	5.2
Accidents E800-E962	0.8	1.5	0.9	0.6	0.7	1.0	0.8	0.5	1.7	2.3	0.9	1.4
Residual 140-486, 590-747, 780-793, 795, E963-E985	1.5	2.6	1.5	1.0	1.2	1.9	1.2	1.0	3.8	4.6	4.0	2.1

[1] Includes neonatal disorders arising from certain diseases of the mother during pregnancy; ill-defined diseases peculiar to early infancy; immaturity with mention of other subsidiary condition; and other diseases peculiar to early infancy not already shown. Ill-defined diseases peculiar to early infancy account for about 60 percent of these deaths.

Table 17. Estimated average annual number of legitimate live births and percent distribution by race and birth weight, according to education of father: United States, 1964-65

Race and birth weight in grams	Education of father					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
	Number of live births in thousands					
All races						
All birth weights	3,572	588	767	1,282	416	518
2,500 grams or less	281	58	72	98	26	28
2,501-3,000 grams	645	110	157	223	75	79
3,001-3,500 grams	1,397	216	293	518	162	208
3,501-4,000 grams	993	143	190	330	114	157
4,001 grams and over	317	61	55	114	40	47
White						
All birth weights	3,094	448	632	1,141	380	493
2,500 grams or less	217	40	50	82	21	25
2,501-3,000 grams	528	76	120	190	67	74
3,001-3,500 grams	1,205	163	245	455	145	197
3,501-4,000 grams	855	121	167	308	107	152
4,001 grams and over	289	48	50	106	39	46
Black						
All birth weights	421	128	124	124	31	15
2,500 grams or less	59	16	22	15	*	*
2,501-3,000 grams	108	33	36	29	7	*
3,001-3,500 grams	161	47	41	53	14	6
3,501-4,000 grams	69	20	20	20	5	*
4,001 grams and over	24	12	*	7	*	*
	Percent distribution by birth weight					
All races						
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	7.9	9.9	9.4	7.6	6.2	5.3
2,501-3,000 grams	18.1	18.8	20.5	17.4	18.1	15.2
3,001-3,500 grams	39.1	36.7	38.2	40.4	38.9	40.2
3,501-4,000 grams	26.1	24.2	24.7	25.8	27.3	30.2
4,001 grams and over	8.9	10.4	7.2	8.9	9.5	9.1
White						
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	7.0	8.9	7.9	7.2	5.5	5.0
2,501-3,000 grams	17.1	17.0	19.0	16.7	17.8	15.0
3,001-3,500 grams	38.9	36.4	38.8	39.8	38.3	39.9
3,501-4,000 grams	27.6	26.9	26.4	27.0	28.2	30.7
4,001 grams and over	9.3	10.8	7.9	9.3	10.3	9.3
Black						
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	14.0	12.4	17.7	12.1	*	*
2,501-3,000 grams	25.7	25.9	29.1	23.3	22.5	*
3,001-3,500 grams	38.2	36.6	33.2	42.6	45.6	41.0
3,501-4,000 grams	16.4	15.8	16.5	16.4	17.2	*
4,001 grams and over	5.8	9.3	*	5.7	*	*

Table 18. Estimated average annual number of legitimate live births and percent distribution by race and birth weight, according to education of mother: United States, 1964-65

Race and birth weight in grams	Education of mother					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
	Number of live births in thousands					
All races						
All birth weights	3,572	445	888	1,560	429	249
2,500 grams or less	281	47	84	110	26	14
2,501-3,000 grams	645	87	174	270	77	37
3,001-3,500 grams	1,397	168	344	615	165	105
3,501-4,000 grams	933	102	213	432	120	66
4,001 grams and over	317	41	73	132	41	29
White						
All birth weights	3,094	342	724	1,403	393	232
2,500 grams or less	217	32	63	88	23	11
2,501-3,000 grams	528	58	134	232	70	33
3,001-3,500 grams	1,205	132	278	549	148	99
3,501-4,000 grams	855	88	184	408	113	61
4,001 grams and over	289	32	65	126	39	28
Black						
All birth weights	421	93	151	138	26	12
2,500 grams or less	59	14	21	20	•	•
2,501-3,000 grams	108	27	38	36	5	•
3,001-3,500 grams	161	32	59	54	11	•
3,501-4,000 grams	69	13	25	22	5	•
4,001 grams and over	24	7	8	7	•	•
	Percent distribution by birth weight					
All races						
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	7.9	10.6	9.4	7.1	6.0	5.5
2,501-3,000 grams	18.1	19.4	19.6	17.3	17.9	14.7
3,001-3,500 grams	39.1	37.8	38.7	39.4	38.5	42.0
3,501-4,000 grams	26.1	23.0	23.9	27.7	28.0	26.4
4,001 grams and over	8.9	9.2	8.3	8.5	9.6	11.4
White						
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	7.0	9.3	8.7	6.3	5.9	4.9
2,501-3,000 grams	17.1	17.0	18.5	16.6	17.8	14.4
3,001-3,500 grams	38.9	38.5	38.4	39.1	37.7	42.5
3,501-4,000 grams	27.6	25.8	25.5	29.1	28.8	26.2
4,001 grams and over	9.3	9.4	9.0	9.0	9.8	12.0
Black						
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	14.0	14.7	13.7	14.2	•	•
2,501-3,000 grams	25.7	28.8	25.1	26.0	20.8	•
3,001-3,500 grams	38.2	34.8	39.2	39.4	41.5	•
3,501-4,000 grams	16.4	14.0	16.7	15.7	19.9	•
4,001 grams and over	5.8	7.7	5.4	4.8	•	•

Table 19. Estimated average annual number of legitimate live births and percent distribution by race and birth weight, according to family income: United States, 1964-65

Race and birth weight in grams	Family income					
	All incomes	Under $3,000	$3,000-$4,999	$5,000-$6,999	$7,000-$9,999	$10,000 and over
	Number of live births in thousands					
All races						
All birth weights	3,572	755	845	914	689	368
2,500 grams or less	281	76	66	76	40	23
2,501-3,000 grams	645	156	161	150	123	55
3,001-3,500 grams	1,397	300	331	355	266	146
3,501-4,000 grams	933	170	214	243	198	108
4,001 grams and over	317	53	73	90	62	38
White						
All birth weights	3,094	509	735	837	659	354
2,500 grams or less	217	43	52	65	35	22
2,501-3,000 grams	528	95	129	133	117	53
3,001-3,500 grams	1,205	200	288	324	256	137
3,501-4,000 grams	855	131	200	228	189	105
4,001 grams and over	289	39	65	88	61	36
Black						
All birth weights	421	229	97	64	22	9
2,500 grams or less	59	30	13	11	*	*
2,501-3,000 grams	108	57	30	16	*	*
3,001-3,500 grams	161	90	36	24	6	*
3,501-4,000 grams	69	38	11	12	6	*
4,001 grams and over	24	13	7	*	*	*
	Percent distribution by birth weight					
All races						
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	7.9	10.0	7.8	8.3	5.9	6.2
2,501-3,000 grams	18.1	20.7	19.1	16.4	17.8	14.8
3,001-3,500 grams	39.1	39.7	39.2	38.8	38.6	39.5
3,501-4,000 grams	26.1	22.6	25.3	26.6	28.7	29.2
4,001 grams and over	8.9	7.1	8.6	9.9	9.0	10.2
White						
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	7.0	8.5	7.1	7.7	5.3	6.3
2,501-3,000 grams	17.1	18.7	17.6	15.9	17.8	15.0
3,001-3,500 grams	38.9	39.3	39.2	38.7	38.9	38.7
3,501-4,000 grams	27.6	25.8	27.3	27.3	28.7	29.7
4,001 grams and over	9.3	7.6	8.8	10.5	9.3	10.3
Black						
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	14.0	13.2	13.2	17.1	*	*
2,501-3,000 grams	25.7	24.9	30.5	24.3	*	*
3,001-3,500 grams	38.2	39.4	37.6	38.0	26.0	*
3,501-4,000 grams	16.4	16.7	11.1	18.0	29.9	*
4,001 grams and over	5.8	5.7	7.6	*	*	*

Table 20. Estimated infant deaths per 1,000 legitimate live births, by education of father and race and birth weight of infant: United States, 1964-65

Race and birth weight in grams	Education of father					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
	Deaths per 1,000 live births					
All races						
All birth weights	23.5	33.8	29.4	19.1	20.8	16.1
2,500 grams or less	185.5	205.7	197.0	153.6	217.1	196.3
2,501-3,000 grams	19.4	24.4	20.6	17.4	17.1	17.7
3,001-3,500 grams	7.3	13.3	9.6	6.1	4.5	3.5
3,501-4,000 grams	6.6	11.9	8.0	5.4	5.9	3.2
4,001 grams or more	9.2	10.9	14.2	6.9	8.5	7.2
White						
All birth weights	21.0	31.1	25.6	17.7	18.7	15.5
2,500 grams or less	184.0	202.2	203.0	150.0	221.4	197.1
2,501-3,000 grams	18.2	25.8	20.0	15.6	14.9	17.3
3,001-3,500 grams	6.8	13.3	8.0	6.0	4.2	3.4
3,501-4,000 grams	5.9	10.7	6.7	5.1	5.2	3.3
4,001 grams or more	7.7	8.0	11.1	6.3	7.2	7.4
Black						
All birth weights	40.7	42.6	48.1	30.6	42.9	*
2,500 grams or less	188.7	*	*	*	*	*
2,501-3,000 grams	24.6	20.5	23.5	27.4	*	*
3,001-3,500 grams	11.3	12.1	19.2	5.4	*	*
3,501-4,000 grams	14.0	*	*	*	*	*
4,001 grams or more	*	*	*	*	*	*

Table 21. Estimated infant deaths per 1,000 legitimate live births, by education of mother and race and birth weight of infant: United States, 1964-65

Race and birth weight in grams	Education of mother					
	All levels	8 years or less	9-11 years	12 years	13-15 years	16 years or more
	Deaths per 1,000 live births					
All races						
All birth weights	23.5	36.6	30.0	18.6	16.5	19.7
2,500 grams or less	185.5	205.9	197.5	167.5	171.8	*
2,501-3,000 grams	19.4	23.4	24.8	14.1	19.7	22.9
3,001-3,500 grams	7.3	13.7	9.5	5.8	3.0	5.9
3,501-4,000 grams	6.6	15.4	8.4	5.1	3.3	3.4
4,001 grams or more	9.2	16.3	9.1	7.6	5.5	11.8
White						
All birth weights	21.0	32.8	26.0	17.5	15.7	19.0
2,500 grams or less	184.0	198.3	183.7	177.3	*	*
2,501-3,000 grams	18.2	28.9	21.3	13.0	19.1	21.7
3,001-3,500 grams	6.8	11.5	9.1	5.8	3.0	5.1
3,501-4,000 grams	5.9	14.0	7.6	4.5	2.9	3.7
4,001 grams or more	7.7	13.9	7.7	6.2	4.4	12.0
Black						
All birth weights	40.7	48.9	47.7	29.4	32.7	*
2,500 grams or less	188.7	*	*	*	*	*
2,501-3,000 grams	24.6	10.7	35.8	20.3	*	*
3,001-3,500 grams	11.3	20.8	11.7	5.1	*	*
3,501-4,000 grams	14.0	*	15.7	*	*	*
4,001 grams or more	*	*	*	*	*	*

Table 22. Estimated infant deaths per 1,000 legitimate live births, by family income and race and birth weight of infant: United States, 1964-65

Race and birth weight in grams	Family income					
	All incomes	Under $3,000	$3,000-$4,999	$5,000-$6,999	$7,000-$9,999	$10,000 and over
	Deaths per 1,000 live births					
All races						
All birth weights	23.5	34.0	25.0	17.6	19.7	20.3
2,500 grams or less	185.5	205.1	205.9	135.1	203.8	*
2,501-3,000 grams	19.4	25.9	17.0	14.1	19.2	22.4
3,001-3,500 grams	7.3	10.5	8.5	5.4	6.1	5.4
3,501-4,000 grams	6.6	12.3	7.1	4.6	4.8	4.7
4,001 grams or more	9.2	16.6	6.9	6.8	7.2	12.0
White						
All birth weights	21.0	30.2	21.2	17.3	19.0	19.9
2,500 grams or less	184.0	205.5	186.6	143.3	221.4	*
2,501-3,000 grams	18.2	27.0	16.0	14.7	16.6	20.0
3,001-3,500 grams	6.8	10.6	7.6	5.2	5.7	5.3
3,501-4,000 grams	5.9	9.8	6.4	4.7	4.7	4.8
4,001 grams or more	7.7	12.9	5.2	6.3	7.4	10.8
Black						
All birth weights	40.7	41.3	53.0	20.4	*	*
2,500 grams or less	188.7	201.8	*	*	*	*
2,501-3,000 grams	24.6	23.8	22.9	*	*	*
3,001-3,500 grams	11.3	10.1	12.4	*	*	*
3,501-4,000 grams	14.0	19.3	*	*	*	*
4,001 grams or more	*	*	*	*	*	*

APPENDIX I

SOURCES AND LIMITATIONS OF DATA

Background of This Report

This report presents data on infant mortality rates for 1964-66 for legitimate infants. Ordinarily, infant mortality rates based on all births and infant deaths registered in the United States are published in *Vital Statistics of the United States.*[3] These regularly published statistics are limited to the amount of information recorded and coded on the birth and death certificates. This report presents data on infant deaths classified by family income and completed education of the mother and father—variables not available in the regularly published statistics. The data were collected as part of the 1964-66 National Infant Mortality Survey (NIMS) and the 1964-66 National Natality Survey (NNS). The survey design of the latter precluded obtaining information on illegitimate births.

Sources of Data

The first sources of data for the survey were the death certificates and the birth certificates of infants. From the death certificate, information such as age of deceased, sex, race, place of death, usual place of residence, and cause of death was obtained. From the birth certificate, information such as sex of child, residence of father and mother, age of father and mother, and race of father and mother was obtained.

The second sources of data were mail questionnaires. For infant deaths, questionnaires were mailed to the persons who provided the funeral director with personal information about the deceased infant for recording on the death certificate. This was usually the mother. For births, the questionnaires were mailed to the mothers.

In the NIMS, for those deaths occurring in 1964 and 1965, a form was also sent to hospitals and institutions in which infants died, to hospitals where infants were born, and to any other hospitals or institutions at which the infants received medical care. If infants died in hospitals or institutions, the name of the hospital or institution in which death occurred was recorded on the death certificate. The name of the hospital where an infant was born and the names of hospitals or institutions where an infant received medical care were derived from responses on the informant questionnaire. Hospitals or institutions to which a form had been sent also provided the names of other hospitals or institutions in which the infant had received medical care in some instances.

Sample Design

The sampling frame for the 1964-66 NIMS was the Current Mortality Sample (CMS)—a 10-percent systematic sample of death certificates received each month by the National Center for Health Statistics from the 54 registration areas in the United States. The sample for the 1964-66 NIMS was a probability sample of 1 out of every 11 deaths under 1 year of age included in the CMS in 1964, 1965, and 1966. This procedure yielded an overall selection rate of approximately 1 out of every 110 infant deaths registered in the United States. Of a total of 2,490 infant deaths in the 1964-66 NIMS, 2,160 were inferred to be legitimate. In the case of infant deaths, legitimacy status is not recorded on the death certificate; legitimacy status was inferred from information on the death certificate and on the questionnaire. The

method of making such inferences, as it pertains to infant deaths, is further defined and explained in appendix II. Table I shows the number of deaths of all infants and the number of deaths of legitimate infants included in the 1964-66 NIMS.

The sampling frame for the 1964-66 NNS was the file of microfilm birth certificates received each month by the National Center for Health Statistics from the 54 registration areas in the United States. As a general rule, each registration area assigns a number to each certificate prior to or during the filming of the birth record. The certificates are numbered consecutively from the first to the last birth occurring during the year.

The sampling for the survey was based on a probability design which made use of these numbers on the birth records. Each 1,000 records constituted a primary sampling unit. Within each 1,000 records, one record was chosen at random. Thus, a sample of 1 out of every 1,000 births was selected from the records for each registration area.

The national sample included a total of 11,331 births. Of these, 647 were reported as illegitimate in the 36 registration areas which record legitimacy status, and 289 others in the 19 areas which do not record legitimacy status were inferred to be illegitimate. The mothers of these 936 illegitimate births were not sent questionnaires. A total of 10,395 legitimate births were therefore included in the survey. Questionnaires were not sent to 70 additional mothers because the birth was registered in the State of New Mexico which did not participate in the survey, to 9 mothers because the birth was registered in the State of California and they were already in the sample of a State survey, and to 10 mothers either because their residence was outside the United States or because no mailing address was obtainable. Thus, a final sample of mothers to whom questionnaires were mailed numbered 10,306.

Table II shows the total number of births registered in the United States and the number in the 1964-66 NNS.

Table I. Total number of infant deaths in the United States and the number of infant deaths in the National Infant Mortality Survey, 1964-66

Number of infant deaths	Total	Year		
		1964	1965	1966
Total count of infant deaths in the United States[1] . .	278,165	99,783	92,866	85,516
Number of infant deaths selected in the sample	2,490	888	830	772
Number of deaths of legitimate infants	2,160	764	733	633

[1] See reference 3.

The Death Certificate, the Birth Certificate, the Questionnaire, and the Hospital Form

As mentioned previously, the death certificate and the birth certificate were the first sources of data for this report. Although not all States use the exact Standard Certificate of Death or the Standard Certificate of Live Birth, both of which are shown in appendix III, all States do include on their certificates items requesting the basic information used in this report. There were no sample cases for which information was missing for the items on the death certificates which were used in this report. In most cases, all items on the birth certificates were answered adequately. There were, however, some birth certificates chosen for the 1964-66 NNS for which information was missing for certain items. Table III shows the number and percentage of birth certificates on which certain items were not answered.

As already noted, in addition to data derived from the death certificates and from the birth certificates, data used in this report were derived from questionnaires sent to persons who provided the funeral director with personal information about the deceased infant (the death certificate informant) and from questionnaires sent to mothers.

The questionnaire sent to the death certificate informant asked for information about the infant who died, information about other children born to the mother, a listing of other members of the household who usually lived with the mother at the time of birth of the deceased infant, employment of mother during

Table II. Total number of births in the United States and the number of births in the National Natality Survey, 1964-66

Number of births	Total	Year		
		1964	1965	1966
Total count of births in the United States	11,393,000	4,027,000	3,760,000	3,606,000
Number of births selected in the sample	11,331	4,025	3,702	3,604
Number of illegitimate births excluded from survey	936	282	345	309
Number of legitimate births in survey	10,395	3,743	3,357	3,295
Number of births from New Mexico and California	79	26	22	31
Other	10		3	7
Number of births for which questionnaire was mailed	10,306	3,717	3,332	3,257

Table III. Number and percentage of birth certificates on which certain items were not answered in the National Natality Survey, 1964-66

Item	Number	Percentage
Age of mother	3	.0
Race of mother	7	.1
Race of father	49	.5
Race of child	9	.1
Sex of child	1	.0
Number of children born alive:		
Now living	43	.4
Now dead	199	1.9
Previous fetal deaths	310	3.0
Completed weeks of pregnancy	678	6.5
Birth weight	25	.2

NOTE—Base: 10,395 legitimate live births.

pregnancy, family income during the previous calendar year, education of mother and of father, and information on health insurance coverage for maternity care.

The questionnaire sent to the mother of a legitimate birth asked questions identical to those on the NIMS, so that comparable data on these items were obtained from both surveys. In addition, information was sought on the mother's expected future fertility.

For the NIMS, the form sent to the hospitals and institutions in 1964 and 1965 asked for information on length of pregnancy and weight of baby at birth, specific details regarding episodes of care provided by that hospital or institution for the infant (such as cause and duration of illness), and for the names and addresses of any other hospitals in which the infant might have been a patient.

Collection of Data

For both the 1964-66 NIMS and the 1964-66 NNS, the principal method of data collection was a mail survey.

For the 1964-66 NIMS, the primary source of information was the person who provided the funeral director with the personal information about the deceased for recording on the death certificate (the death certificate informant). The mailing address of the death record informant is usually reported on the death certificate. For infant deaths, the informant is usually the mother; however, information was accepted from the father, maternal grandmother, and paternal grandmother (in that order) if the mother was not available to complete the questionnaire. For those cases where the name or address of the informant was not available on the death certificate or additional sources of information were required, a letter was sent to the funeral director requesting the address of the informant and/or names and addresses of other relatives of the deceased infant to whom a questionnaire might be sent.

For the 1964-66 NNS, questionnaires were mailed to the mothers of legitimate infants, using the address of the mother recorded as her usual place of residence. Information was accepted from other respondents only if there was no possibility of obtaining it from the mother.

For both surveys, there were followup procedures when there was no response to the original queries. If after 2 to 3 weeks no response was received from a death certificate informant, a funeral director, or a mother of a legitimate live birth, the first followup mailing was sent by certified mail. If no response was received to the first followup mailing within 3 weeks, a second followup occurred by regular mail; however, no second followup mailing was made to funeral directors. If no response was received from the second followup mailing, there was additional provision for collecting information by use of telephone or by personal interview carried out by the U.S. Bureau of the Census if the person resided in one of the primary sampling units designated by the Bureau of the Census.

For the 2,160 legitimate infant deaths in the 1964-66 NIMS, the response rate was 88 percent. For the 10,395 legitimate births in the 1964-66 NNS, the response rate was 89 percent.

Table IV shows the number and percent of respondents to the questionnaires sent to death certificate informants by selected characteristics of legitimate infants who died in 1964-65. Response rates by characteristics of deceased infants could not be calculated for 1966 because the information was not coded.

Table V shows the number of mothers of legitimate births in the survey and the percent responding to the questionnaire by selected characteristics of the mothers of legitimate births.

Nonresponse and Imputation for Missing Data

A "nonresponse" represents a major problem in any survey. Nonresponse in the 1964-66 NIMS was defined to include those cases for which an informant was not identified from the death certificate and the funeral director was unable to provide names and addresses of relatives of the deceased infant to whom a questionnaire might be sent, those cases for which questionnaires were returned but were uncodable, those cases for which there was no response at all by mail or by interview, those cases for which the informant was not queried for other reasons, and those cases for which there was a refusal to answer the questionnaire.

Nonresponse in the 1964-66 NNS was defined to include those cases for which no questionnaire was mailed if the birth certificate was filed in New Mexico, those cases for which no questionnaires were mailed because no usable mailing address was obtained, the mothers resided outside the United States or were included in the California survey, those cases for which no questionnaire was returned after all followup procedures had been completed, and those cases for which questionnaires were returned but were not usable.

All of the above cases for which no information from the questionnaires was available or usable are referred to as "unit nonresponses." Imputation was carried out for "unit nonresponses" according to the following specifications.

Data in the 1964-66 NIMS were adjusted for unit nonresponse by imputing for a decedent for whom no questionnaire was returned the data for a decedent for whom a questionnaire was returned. The imputation was carried out in the following manner. Four subgroups were defined:

Table IV. Number and percent responding to informant questionnaire by selected characteristics of deceased legitimate infants in the National Infant Mortality Survey, 1964-66

Characteristics of deceased infants	Total number of legitimate infants, 1964-66	Total number of legitimate infants, 1964-65	Percent of 1964-65 infants on which response was received
Total	2,160	1,497	87.9
Race			
White	1,707	1,164	88.7
Black	418	302	86.4
Other races	35	31	71.0
Region			
Northeast	450	302	90.7
North Central	626	439	89.5
South	749	515	89.3
West	335	241	78.4
Metropolitan status			
Metropolitan	1,330	907	88.9
Nonmetropolitan	830	590	86.4
Cause of death			
Infective and parasitic diseases 001-138	15	10	90.0
Influenza and pneumonia, except pneumonia of newborn 480-493	230	173	87.3
Other diseases of respiratory system 510-522, 525-527	48	33	97.0
Gastritis, duodenitis, enteritis, and colitis, except diarrhea of newborn 543, 571, 572	45	35	80.0
Other diseases of digestive system 530-542, 544-553, 573-587	20	13	92.3
Congenital malformations 750-759	346	232	92.7
Birth injuries 760, 761	180	135	92.6
Postnatal asphyxia and atelectasis 762	358	244	84.8
Hemolytic disease of newborn (erythroblastosis) 770	35	22	81.8
Immaturity, unqualified 776	337	231	89.2
Certain diseases of early infancy 760-776	335	224	84.8
Symptoms and ill-defined conditions 780-793, 795	53	36	83.3
Accidents E800-E962	75	52	78.8
Residual	83	57	91.2
Age at death			
Under 1 day	917	613	88.3
1-6 days	525	361	89.5
7-27 days	155	105	85.7
28 days-5 months	400	293	87.4
6-11 months	163	125	84.8

Table V. Number and percent responding by selected characteristics of mothers in the National Natality Survey, 1964-66

Characteristic of mother	Number in survey	Percent responding
Total	10,395	88.8
Age		
Under 20 years	1,466	82.5
20-24 years	3,698	88.7
25-29 years	2,617	90.7
30-34 years	1,562	90.7
35 years and over	1,052	90.5
Color		
White	9,096	89.5
All other	1,299	84.0
Live-birth order		
First	3,009	88.7
Second	2,596	89.4
Third	1,852	89.4
Fourth	1,208	89.1
Fifth or higher	1,730	87.2
Region of residence		
Northeast	2,445	92.8
North Central	2,968	91.4
South	3,246	87.1
West	1,736	82.0
Metropolitan status		
Inside SMSA	6,682	90.4
Outside SMSA	3,713	85.9

white males, white females, all other males, and all other females. The data required to assign a case to one of these four groups were complete on all death certificates selected for the 1964-66 NIMS, regardless of whether there was a response to the mail questionnaire. After the close of the survey, the complete file of records of infant deaths was put in random order. This file included those records which were unit responses as well as those records which were unit nonresponses. Imputation was carried out by imputing to a nonresponse record the values found for the last previous record for which there was a response and which fell into the same one of the four imputation groups.

For the 1964-66 NNS, imputation of information in instances of unit nonresponse was carried out through a similar procedure, except that (1) only legitimate infants were included, and (2) there were 24 imputation classes based on age of mother, live-birth order, and color of mother. These characteristics are recorded on the birth certificate and were therefore available for all sample cases whether a questionnaire was returned or not. The 24 imputation classes were defined as follows:

Group	Color and age	Live-birth order
	White	
1	Under 20 years	1
2	Under 20 years	2+
3	20-24 years	1
4	20-24 years	2
5	20-24 years	3+
6	25-29 years	1
7	25-29 years	2
8	25-29 years	3-4
9	25-29 years	5+
10	30-34 years	1-2
11	30-34 years	3-4
12	30-34 years	5+
13	35 years and over	1-4
14	35 years and over	5+
	All other	
15	Under 20 years	1
16	Under 20 years	2+
17	20-24 years	1-2
18	20-24 years	3+
19	25-29 years	1-2
20	25-29 years	3-4
21	25-29 years	5+
22	30-34 years	1-4
23	30-34 years	5+
24	35 years and over	All

Besides those cases referred to as "unit nonresponses," there were cases for which questionnaires were returned but certain information was missing. The missing information is referred to as "item nonresponse."

For the 1964-66 NIMS, there were several possible actions when item nonresponse occurred. These included editing-in the information on the missing items if it could be obtained from another part of the questionnaire, other forms, letters accompanying forms, or the death certificate; sending a special letter to the person who answered the questionnaire asking for the missing information; or referring the case to the study director for review, after which either a special letter was sent asking for the missing information, a phone call or personal interview was carried out by the Bureau of the Census, a form was sent to the funeral director asking for the names and addresses of relatives of the deceased infant to whom informant questionnaires might be sent, or the case was closed.

If a special letter was sent asking for the missing information and it was not returned or was returned but the information asked for was not provided, the case was also referred to the study director for review, whereupon either a phone call or personal interview was carried out by the Bureau of the Census, a form was sent to the funeral director asking for the names and addresses of relatives of the deceased so new informants could be queried, or the case was closed.

For the 1964-66 NNS, actions taken when item nonresponse occurred included editing-in the missing information if it could be supplied from another part of the questionnaire or the birth certificate; sending a special letter to the person who answered the questionnaire asking for the missing information; or referring the case to the study director for review after which either a special letter was sent asking for the missing information, a phone call or personal interview was carried out by the Bureau of the Census, or the case was closed.

Data in the 1964-66 NIMS were adjusted for item nonresponse in a manner different from that applied to unit nonresponse. Imputation for item nonresponse was carried out by taking into consideration the information provided for other items on the questionnaire which was pertinent to the missing information. For example, if there was missing information for the question on family income in the last calendar year previous to the year of death, information given by the informant on the household listing and information provided on education of the father would be considered if it were available. In such a case, the last previous questionnaire for which the responses for household listings and for education of father were coded in the same categories as those on the questionnaire with the missing information was chosen. The value for the item on which there was missing information was then taken from this last previous record and imputed to the item where there was missing information. This method of imputation was carried out for each case of item nonresponse. It should be emphasized that household listing and education of father were not the only items considered when imputation was carried out for a missing item nor were they the only items used to impute family income for all cases for which information was missing on family income. Rather, for item nonresponse each item of each case for which there was missing information was considered individually. Possible bias in selecting the last previous record was avoided by the random ordering of the records which was done between each step of the imputation procedure.

Table VI shows the nonresponse rates for some items from the 1964-65 NIMS questionnaire. Nonresponse rates are for 1964-65 only because, as mentioned previously, in 1966 whether there was or was not a response to the questionnaire for each individual case was not coded. As can be seen in table VI, the item for which nonresponse rates were highest was family income (information not obtained for 7.3 percent of the respondents to the questionnaire).

Table VI. Item nonresponse rates for selected items on the National Infant Mortality Survey, 1964-65

Item	Number	Percent
Family income	96	7.3
Year of birth of mother	45	3.4
Educational attainment of father	29	2.2
Year of first marriage	26	2.0
Educational attainment of mother	9	0.7
Previous fetal deaths	9	0.7
Employment during pregnancy	5	0.4
Total children ever born alive	1	0.1
Total children not now alive	2	0.2

NOTE.—Base: 1,316 unit responses, legitimate births only.

For the 1964-66 NNS, item nonresponse rates were generally low—usually less than 1 percent. Most of the item nonresponses were imputed on the basis of information available elsewhere on the birth certificate or questionnaire. For example, mother's age as recorded on the birth certificate was used to impute her year of birth when she had not completed that questionnaire item. Other items with very low nonresponse rates (less than 0.5 percent) were imputed arbitrarily. Five items with fairly high nonresponse rates were imputed in the computer by procedures similar to those used for unit imputation on the basis of matrices designed specifically for each item. For example, education of father was imputed by using age of father and education of mother; family income was imputed by using age of father and education of father.

Table VII shows the nonresponse rates for some items from the 1964-66 NNS questionnaire.

Weighting Procedures for National Estimates

Statistics on infant deaths and births in this report are national estimates prepared by use of a postsurvey, stratified ratio estimation procedure. This estimation procedure, which takes into account the total number of registered infant deaths for the 1964-66 NIMS and the total number of registered births estimated from a 50-percent sample for the 1964-66 NNS, reduces the sampling error by making the sample more representative of the population of all infant deaths or of all births than would be expected to occur by random sampling alone.

Table VII. Item nonresponse rates for selected items on the National Natality Survey, 1964-66

Item	Number	Percent
Age of father	61	.7
Educational attainment of father	78	.8
Educational attainment of mother	15	.2
Year of first marriage	35	.4
Employment during pregnancy	13	.1
Family income	231	2.5

NOTE.—Base: 9,232 unit responses, legitimate births only.

For the 1964-66 NIMS, for each of the four groups that were used for imputation, the national count of all registered infant deaths for the appropriate year was obtained from *Vital Statistics of the United States.*[3] A weight for each group was then calculated by dividing the number of sample deaths in each group into the number of registered deaths in each group for each year of the survey. The product of the weight and the sample count equals the national total of infant deaths for that group.

For the 1964-66 NNS, for each of the 24 groups that were used for imputation, the national count of registered births estimated from a 50-percent sample was obtained from *Vital Statistics of the United States.*[4] A weight for each group was then calculated by dividing the number of sample births in each group into the number of registered births in each group for each year of the survey. The product of the weight and the sample count equals the national total of births for that group.

The effect of these weighting procedures is to make the estimates from the 1964-66 NIMS sample more consistent with the estimates of the total number of registered infant deaths and to make the estimates from the 1964-66 NNS more consistent with the estimates of births based on the 50-percent sample, for each of the groups used in the estimation procedure. However, since data in this report refer only to deaths and births of legitimate infants, the estimates in this report are not comparable to the total numbers of births and infant deaths reported in *Vital Statistics of the United States,* since the latter include all deaths and births, legitimate and illegitimate.

Estimates of characteristics are produced from a sample using the following formulas:

1964-66 National Infant Mortality Survey

$$X_i' = \sum_{i=1}^{4} \frac{x_i}{y_i} Y_i$$

1964-66 National Natality Survey

$$X_i' = \sum_{i=1}^{24} \frac{x_i}{y_i} Y_i$$

where

X_i' is the estimate of the number of deaths or births with a particular characteristic in group i,

x_i is the count of sample deaths or births with the characteristic in group i,

y_i is the count of all sample deaths or births in group i, and

Y_i is the total number of registered deaths in group i, or the total number of registered births in group i based on the 50-percent sample.

Reliability of Estimates

Since the statistics derived from a survey are estimates based on a sample, they may differ from the figures that would have been obtained had a total count been made using the same questionnaire and procedures.

The probability design of the sample for these surveys makes possible the calculation of sampling errors. The standard error is a measure of the sampling variation that occurs by chance because only a sample rather than entire population is surveyed. The chances are about 68 out of 100 that an estimate from the sample differs from the value for the entire population by less than the standard error. The chances are about 95 out of 100 that the difference is less than twice the standard error and about 99 out of 100 that the difference is less than three times the standard error.

Estimates of sampling variability for the statistics derived from each survey were based on 20 random half-sample replications. This technique yields overall variability through observation of variability among random subsamples of the total sample. It reflects both the error that arises from sampling and a part of the measurement error, but it does not measure any systematic biases in the data. A general discussion of the development and evaluation of a replication technique for estimating variance has been published elsewhere.[5] However, the procedures and computations required to estimate variances by this method are briefly described below.

For both surveys, each record from the entire file of records in the survey was assigned systematically to a random group between 1 and 40. Twenty pairs of random groups were created from these groups. A half sample was formed by randomly selecting one group from each of the 20 pairs. This process was repeated until 20 "replicate half samples" were formed from which variance estimates were derived. The composition of the 20 half samples was determined by an orthogonal plan.

After the composition of each of the half samples was determined, all the estimation procedures used to produce the final estimates for the entire sample were applied separately to each of the resulting half samples.

An estimated variance $S_{x'}^2$ of an estimated statistic x' of the parameter X is obtained by applying the following formula:

$$S_{x'}^2 = \frac{1}{20} \sum_{i=1}^{20} (x_i'' - x')^2$$

where

x' is the estimate of X based on the entire sample, and

x'' is the estimate of X based on half sample i.

Rules to determine the approximate standard errors for aggregates and for rates presented in this report are as follows:

1. *Estimates of aggregates*: Approximate standard errors for estimates of aggregates which are not derived from the groups used in ratio estimation, such as the number of infant deaths or births to families where the father was a high school graduate, are given in table VIII if the estimate refers to deaths and in table IX if the estimate refers to births. There are no standard errors for estimates of aggregates if the estimates are derived from the groups used in ratio estimation.

Table VIII. Approximate standard errors for estimated numbers shown in this report, 1964-66 National Infant Mortality Survey

Size of estimate	1964-65		1964-66	
	Standard error	Relative standard error	Standard error	Relative standard error
250	110	44.0	98	39.2
500	165	33.0	142	28.4
1,000	230	23.0	181	18.1
1,500	270	18.0	233	15.5
2,000	310	15.5	260	13.0
3,000	385	12.8	320	10.7
4,000	455	11.4	380	9.5
5,000	485	9.7	405	8.1
10,000	630	6.3	466	4.7
15,000	700	4.7	533	3.6
20,000	800	4.0	600	3.0
30,000	960	3.2	767	2.6

Table IX. Approximate standard errors for estimated numbers shown in this report, 1964-66 National Natality Survey

Size of estimate	1964-65		1964-66	
	Standard error	Relative standard error	Standard error	Relative standard error
5,000	1,800	36.0	1,490	[1] 29.8
10,000	2,368	23.7	1,960	19.6
15,000	2,682	17.9	2,220	14.8
20,000	2,948	14.7	2,440	12.2
25,000	3,293	13.2	2,725	10.9
50,000	4,531	9.1	3,750	7.5
75,000	5,437	7.2	4,500	6.0
100,000	5,933	5.9	4,910	4.9
150,000	7,069	4.7	5,850	3.9
200,000	7,975	4.0	6,600	3.3
250,000	8,670	3.5	7,175	2.9
300,000	9,171	3.1	7,590	2.5
500,000	12,204	2.4	10,100	2.0
700,000	15,309	2.2	12,670	1.8
1,000,000	15,950	1.6	13,200	1.3

2. *Estimates of rates*: Approximate standard errors for estimated rates, such as the number of infant deaths to the number of births, are determined in the following way. When the rate is an estimate which was not derived from the classes used in ratio estimation, such as the infant mortality rate for families with incomes of under $3,000, the approximate standard errors are given in table X when the rate was based on 2 years of data, and in table XI when the rate was based on 3 years of data. When the rate is an estimate which was derived from the classes used in ratio estimation, such as the infant mortality rate for white infants, there are no standard errors.
3. *Difference between two sample estimates*: The standard error of a difference between two sample estimates is approximately the square root of the sum of the squares of the standard error of the two estimates. This formula will represent the actual standard error quite accurately for the difference between separate and uncorrelated characteristics, although it is only a rough approximation in cases where the characteristics are correlated.

In addition to sampling errors, survey results are subject to errors in conceptual formulation, ambiguities and misinterpretations arising from the wording of the questions, biases due to nonresponse or incomplete response, and errors in coding, editing, and tabulation. There is no way of computing the magnitude of these errors.

Errors in conceptual formulation and ambiguities of the 1964-66 NNS were reduced by pretesting the questionnaire before initiating the survey. The steps taken to reduce biases due to nonresponse in each survey were discussed in the section of this appendix, "Nonresponse and Imputation for Missing Data." Errors in tabulation were reduced, if not eliminated, by cross-checking the tabulations and by comparing data from each survey with data from other sources when available.

Rounding of Numbers

In this report, estimates of aggregates are rounded to the nearest thousand. The original

Table X. Approximate standard errors of infant mortality rates based on 2 years of data

Average annual number of live births	Infant mortality rate per 1,000 live births										
	5	10	20	30	40	50	60	70	80	90	100
	Standard error expressed as rate										
10,000									27.3	29.6	32.5
15,000				11.6	14.8	15.6	18.1	20.3	21.8	24.0	25.8
25,000		4.9	7.3	8.6	10.5	12.0	13.6	15.3	16.7	18.1	19.6
50,000	2.3	3.6	4.9	6.1	7.3	8.5	9.6	10.7	11.9	12.2	13.6
100,000	1.7	2.3	3.4	4.3	5.3	5.8	6.2	6.7	7.2	7.7	8.6
150,000	1.2	1.8	2.8	3.4	3.9	4.3	4.7	5.0	5.5	5.9	6.9
250,000	1.0	1.5	2.1	2.4	2.7	2.9	3.3	3.7	4.0	4.5	5.0
500,000	.9	1.0	1.2	1.5	2.2	2.4	2.4	2.7	3.1		
1,000,000	.5	.6	.9	1.1	1.5						

NOTE.—Numerator: 1964-65 National Infant Mortality Survey; Denominator: 1964-65 National Natality Survey.

Table XI. Approximate standard errors of infant mortality rates based on 3 years of data

Average annual number of live births	Infant mortality rate per 1,000 live births										
	5	10	20	30	40	50	60	70	80	90	100
	Standard error expressed as rate										
10,000									22.3	24.2	26.5
15,000				9.5	12.1	12.7	14.8	16.6	17.8	19.6	21.1
25,000		4.0	6.0	7.0	8.6	9.8	11.1	12.5	13.6	14.8	16.0
50,000	1.9	2.9	4.0	5.0	6.0	6.9	7.8	8.7	9.7	10.0	11.1
100,000	1.4	1.9	2.8	3.5	4.3	4.7	5.1	5.5	5.9	6.3	7.0
150,000	1.0	1.5	2.3	2.8	3.2	3.5	3.8	4.1	4.5	4.8	5.6
250,000	0.8	1.2	1.7	2.0	2.2	2.4	2.7	3.0	3.3	3.7	4.1
500,000	0.7	0.8	1.0	1.2	1.8	2.0	2.0	2.2	2.5		
1,000,000	0.4	0.5	0.7	0.9	1.2						

NOTE.—Numerator: 1964-66 National Infant Mortality Survey; Denominator: 1964-66 National Natality Survey.

tabulations on which this report is based, however, show figures to the nearest whole unit and all totals, percentages, ratios, and averages in this report were computed using these unrounded figures. The reader should be cautioned that in recomputing these totals, percentages, ratios, and averages by use of the rounded figures, exactly the same result may not occur.

APPENDIX II

DEFINITIONS OF TERMS USED IN THIS REPORT

Education of father.—Education of father refers to the highest grade of regular school completed. Regular school consists of elementary, high school, and college or university, but does not include trade or business schools. In both surveys, data on education of father were derived from responses to the questionnaire which asked for the highest grade of school attended and whether or not that grade was completed.

Education of mother.—Education of mother refers to the highest grade of regular school completed. Data on education of mother were derived in the same manner as were data on education of father.

Family income.—In both surveys, family income refers to the total of all income received during the calendar year prior to the year during which the birth or the infant death occurred. Family income was defined to include all income received by the mother and by all persons related to the mother by blood, marriage, or adoption, and living in the same household at the time of birth. Income from all sources such as wages, salaries, unemployment compensation, rent, interest, dividends, help from relatives, profits and fees from own business or farm, welfare payments, social security payments, and insurance proceeds was asked for.

Geographic region.—In both surveys State of residence, as reported on the certificates, was classified according to four regions which correspond to the regions used by the U.S. Bureau of the Census. These regions and the States which are included in each region are as follows:

Region	*States Included*
Northeast	Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont
North Central	Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin
South	Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia
West	Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming

Metropolitan or nonmetropolitan county.—In both surveys usual residence, as reported on the certificates, was classified by location inside or outside counties or cities falling in standard metropolitan statistical areas (SMSA's) as defined by the Office of Management and Budget and used by the Bureau of the Census. In New England, metropolitan State economic areas (MSEA's) are used in place of SMSA's. Residence inside counties or cities falling in either SMSA's or MSEA's was termed metropolitan county of residence. If residence was not in a metropolitan county, it was in a nonmetropolitan county.

Age of mother.—In the National Natality Survey, age of mother was recorded or derived from entries on the birth certificate. In the National Infant Mortality Survey, age of mother was derived from responses to the infant mortality survey questionnaire which asked for the date of birth of the mother. Age in this report refers to age at last birthday.

Birth weight.—In the National Natality Survey, birth weight was recorded or derived from the birth certificate. In almost all cases, birth weight was recorded in pounds and ounces. It was converted into grams by taking 1 pound equal to 454 grams. In the National Infant Mortality Survey, birth weight was derived from forms sent to hospitals which had provided care to the deceased infant. This included the hospital at which birth occurred, other hospitals at which the infant had a period of care, and the hospital at which death occurred, if the death occurred in a hospital. Data on birth weight of deceased infants was available only for infants who died during 1964 and 1965.

Legitimacy status (National Infant Mortality Survey).—In the National Infant Mortality Survey, legitimacy of the infant was inferred by using information on the death certificate and on the questionnaire. If mother, father, and child all had the same last name, and if mother's maiden name was different from the child's on the death certificate, the child was inferred to be legitimate. Legitimacy was also inferred if on a returned questionnaire the mother was listed as being married, the date of marriage was before or equal to the date of birth of the child, and the father was accounted for in the questionnaire on household listing. On the other hand, if the child had the same last name as the mother and if the father's name was different or not given on the death certificate, illegitimacy was inferred. The child was also inferred as being illegitimate if the mother reported her marital status as single and if no date of marriage was given on the returned questionnaire.

Legitimacy status (National Natality Survey).—In the National Natality Survey, for the 36 areas reporting legitimacy on the birth record, legitimacy of the infant was recorded or derived from the entry on the birth certificate. For areas not reporting legitimacy on the birth record, it was inferred by using the same rules as were used for the National Infant Mortality Survey. In a few cases, a recorded legitimate birth was changed to an inferred illegitimate birth when the mother stated on a questionnaire that she had never been married.

Live birth.—A live birth, according to the World Health Organization, is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which after such separation, breathes or shows any other evidence of life such as beating of heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered liveborn and a certificate of live birth should be filed.

Infant death.—An infant death is the death of an infant under 1 year of age.

Age at death.—The age of the infant at the time of death was recorded or derived from the death certificate.

Cause of death.—Cause of death was recorded or derived from entries on the death certificate. The coding of cause of death from the entry on the death certificate was in accordance with the specifications of the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death*, World Health Organization, Vol. I, 1957 (Seventh Revision).

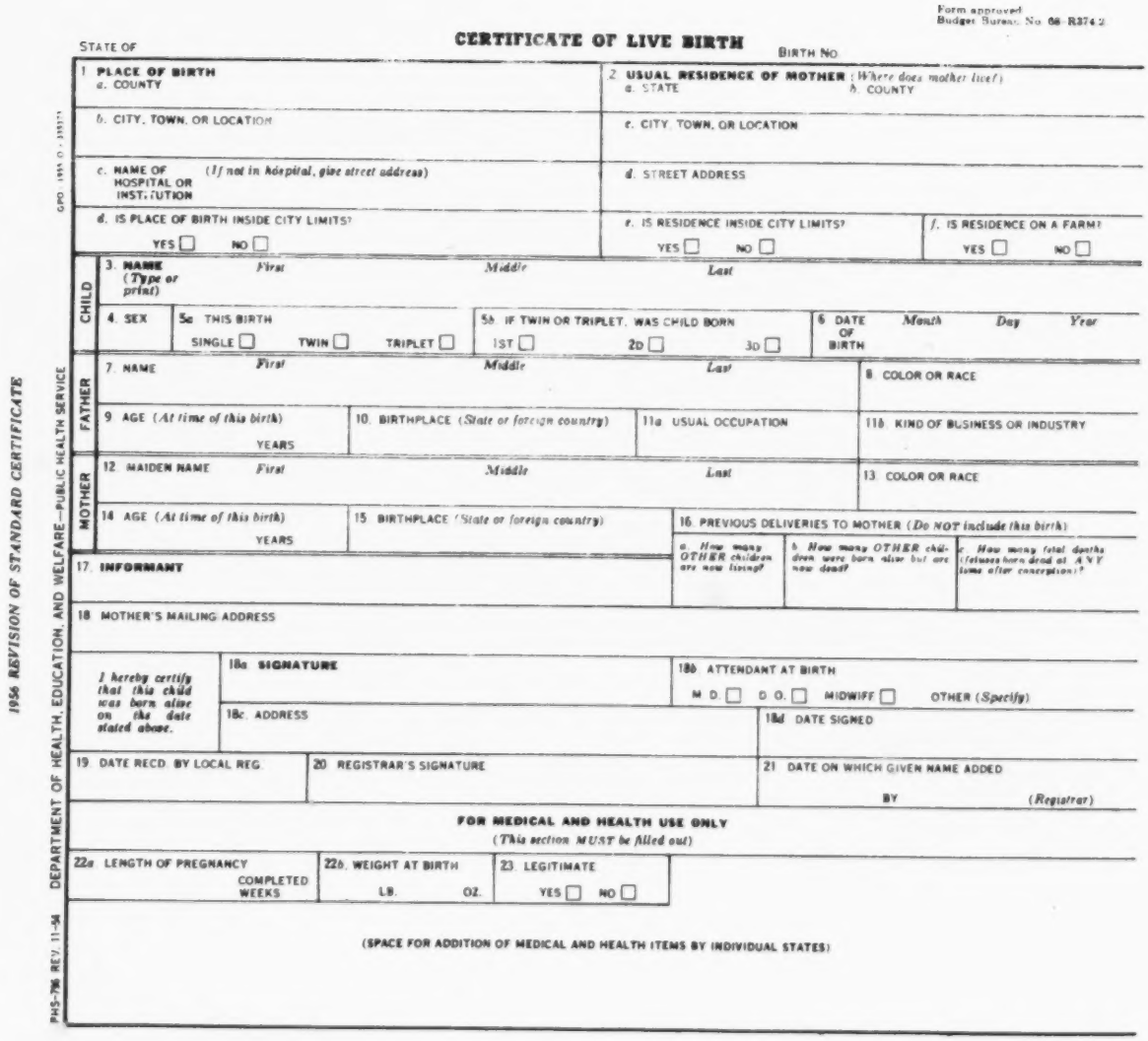
Sex.—Sex of infant was recorded or derived from entries on the birth certificate or death certificate.

Race and color.—In the National Infant Mortality Survey, race was recorded or derived from entries on the death certificate. The category "white" includes those decedents reported as white, Mexican, or Puerto Rican. The category "black" includes only those decedents reported as Negro. The category "other races" includes decedents reported as Japanese, Aleut, Eskimo, Hawaiian, or Part-Hawaiian. In the National Natality Survey, race was recorded or derived from entries of the race of the parents on the birth certificate and then classified into the same categories as in the National Infant Mortality Survey.

APPENDIX III

SOURCE FORMS

Standard Certificate of Live Birth



Form approved
Budget Bureau No. 68-R374.2

STATE OF

CERTIFICATE OF LIVE BIRTH

BIRTH NO.

1 PLACE OF BIRTH
a. COUNTY
b. CITY, TOWN, OR LOCATION
c. NAME OF HOSPITAL OR INSTITUTION (If not in hospital, give street address)
d. IS PLACE OF BIRTH INSIDE CITY LIMITS? YES ☐ NO ☐

2 USUAL RESIDENCE OF MOTHER (Where does mother live?)
a. STATE b. COUNTY
c. CITY, TOWN, OR LOCATION
d. STREET ADDRESS
e. IS RESIDENCE INSIDE CITY LIMITS? YES ☐ NO ☐
f. IS RESIDENCE ON A FARM? YES ☐ NO ☐

CHILD

3. NAME (Type or print) First Middle Last
4. SEX
5a. THIS BIRTH SINGLE ☐ TWIN ☐ TRIPLET ☐
5b. IF TWIN OR TRIPLET, WAS CHILD BORN 1ST ☐ 2D ☐ 3D ☐
6. DATE OF BIRTH Month Day Year

FATHER

7. NAME First Middle Last
8. COLOR OR RACE
9. AGE (At time of this birth) YEARS
10. BIRTHPLACE (State or foreign country)
11a. USUAL OCCUPATION
11b. KIND OF BUSINESS OR INDUSTRY

MOTHER

12. MAIDEN NAME First Middle Last
13. COLOR OR RACE
14. AGE (At time of this birth) YEARS
15. BIRTHPLACE (State or foreign country)
16. PREVIOUS DELIVERIES TO MOTHER (Do NOT include this birth)
a. How many OTHER children are now living?
b. How many OTHER children were born alive but are now dead?
c. How many fetal deaths (stillborn or dead at ANY time after conception)?

17. INFORMANT

18. MOTHER'S MAILING ADDRESS

I hereby certify that this child was born alive on the date stated above.

18a. SIGNATURE
18b. ATTENDANT AT BIRTH M.D. ☐ D.O. ☐ MIDWIFE ☐ OTHER (Specify)
18c. ADDRESS
18d. DATE SIGNED

19. DATE RECD. BY LOCAL REG.
20. REGISTRAR'S SIGNATURE
21. DATE ON WHICH GIVEN NAME ADDED BY (Registrar)

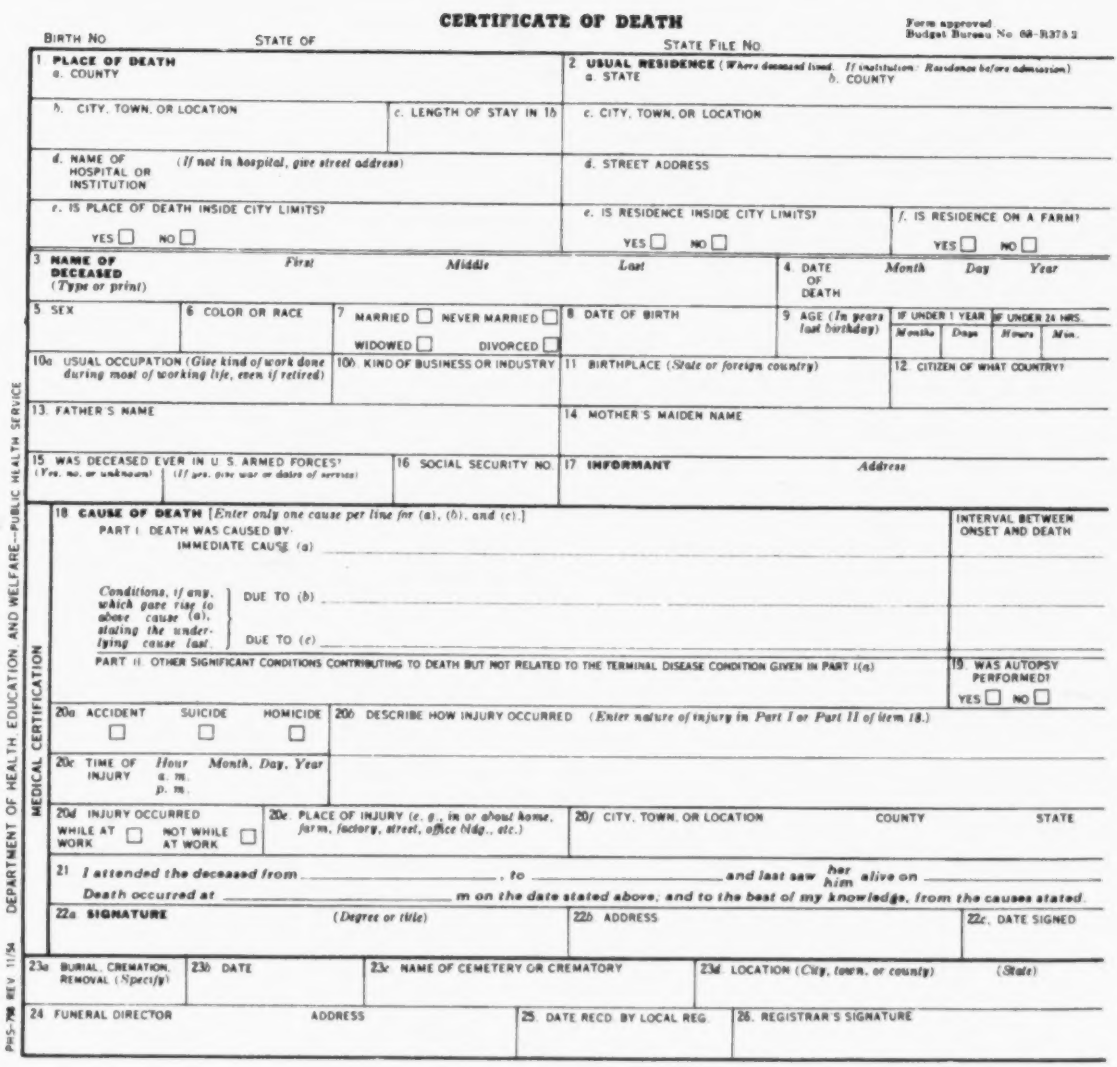
FOR MEDICAL AND HEALTH USE ONLY
(This section MUST be filled out)

22a. LENGTH OF PREGNANCY COMPLETED WEEKS
22b. WEIGHT AT BIRTH LB. OZ.
23. LEGITIMATE YES ☐ NO ☐

(SPACE FOR ADDITION OF MEDICAL AND HEALTH ITEMS BY INDIVIDUAL STATES)

1956 REVISION OF STANDARD CERTIFICATE
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE
PHS-796 REV. 11-54
GPO 1955 O - 339171

Standard Certificate of Death



CERTIFICATE OF DEATH

Form approved
Budget Bureau No. 68-R378.2

BIRTH NO. STATE OF STATE FILE NO.

1 **PLACE OF DEATH** a. COUNTY

b. CITY, TOWN, OR LOCATION | c. LENGTH OF STAY IN 1b

d. NAME OF HOSPITAL OR INSTITUTION (*If not in hospital, give street address*)

e. IS PLACE OF DEATH INSIDE CITY LIMITS? YES ☐ NO ☐

2 **USUAL RESIDENCE** (*Where deceased lived. If institution: Residence before admission*) a. STATE b. COUNTY

c. CITY, TOWN, OR LOCATION

d. STREET ADDRESS

e. IS RESIDENCE INSIDE CITY LIMITS? YES ☐ NO ☐

f. IS RESIDENCE ON A FARM? YES ☐ NO ☐

3 **NAME OF DECEASED** (*Type or print*) *First* *Middle* *Last*

4 DATE OF DEATH *Month* *Day* *Year*

5 SEX | 6 COLOR OR RACE | 7 MARRIED ☐ NEVER MARRIED ☐ WIDOWED ☐ DIVORCED ☐

8 DATE OF BIRTH | 9 AGE (*In years last birthday*) IF UNDER 1 YEAR *Months* *Days* IF UNDER 24 HRS. *Hours* *Min.*

10a USUAL OCCUPATION (*Give kind of work done during most of working life, even if retired*) | 10b. KIND OF BUSINESS OR INDUSTRY | 11 BIRTHPLACE (*State or foreign country*) | 12 CITIZEN OF WHAT COUNTRY?

13. FATHER'S NAME | 14 MOTHER'S MAIDEN NAME

15 WAS DECEASED EVER IN U. S. ARMED FORCES? (*Yes, no, or unknown*) (*If yes, give war or dates of service*) | 16 SOCIAL SECURITY NO. | 17 **INFORMANT** *Address*

MEDICAL CERTIFICATION

18 **CAUSE OF DEATH** [*Enter only one cause per line for (a), (b), and (c).*] INTERVAL BETWEEN ONSET AND DEATH

PART I. DEATH WAS CAUSED BY: IMMEDIATE CAUSE (a) _____

Conditions, if any, which gave rise to above cause (a), stating the underlying cause last. DUE TO (b) _____

DUE TO (c) _____

PART II. OTHER SIGNIFICANT CONDITIONS CONTRIBUTING TO DEATH BUT NOT RELATED TO THE TERMINAL DISEASE CONDITION GIVEN IN PART I(a)

19. WAS AUTOPSY PERFORMED? YES ☐ NO ☐

20a ACCIDENT ☐ SUICIDE ☐ HOMICIDE ☐ | 20b DESCRIBE HOW INJURY OCCURRED (*Enter nature of injury in Part I or Part II of item 18.*)

20c TIME OF INJURY *Hour* a. m. p. m. *Month, Day, Year*

20d INJURY OCCURRED WHILE AT WORK ☐ NOT WHILE AT WORK ☐ | 20e. PLACE OF INJURY (*e. g., in or about home, farm, factory, street, office bldg., etc.*) | 20f CITY, TOWN, OR LOCATION COUNTY STATE

21 *I attended the deceased from _____, to _____ and last saw her/him alive on _____*
Death occurred at _____ m on the date stated above; and to the best of my knowledge, from the causes stated.

22a **SIGNATURE** (*Degree or title*) | 22b. ADDRESS | 22c. DATE SIGNED

23a BURIAL, CREMATION, REMOVAL (*Specify*) | 23b DATE | 23c NAME OF CEMETERY OR CREMATORY | 23d. LOCATION (*City, town, or county*) (*State*)

24 FUNERAL DIRECTOR ADDRESS | 25. DATE RECD. BY LOCAL REG. | 26. REGISTRAR'S SIGNATURE

PHS-708 REV. 11/54 DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE

1958 REVISION OF STANDARD CERTIFICATE

1964-1966 National Natality Survey Questionnaire

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
WASHINGTON, D.C. 20201

NATIONAL CENTER FOR
HEALTH STATISTICS

The U. S. Public Health Service is conducting a national study of families having babies during 1966. In this study, we are particularly interested in learning about the size and types of these families, as well as about other family characteristics. This information is needed in order to better understand the growth and changes taking place in our population. Detailed and accurate information of this type is essential for intelligent planning of programs to improve the Nation's health and welfare.

This national study will be based on information obtained from families which were selected as a sample from among the 4 million families having a baby during 1966. Your family was one of those selected. Please answer the questions on the following pages and return this form in the enclosed postage-free envelope.

As you might expect, statistical accuracy requires that we receive your reply and those of all of the other families in the study. You may be assured that all information which you report about yourself and your family will be kept completely confidential, in accordance with regulations of the U. S. Public Health Service. Your cooperation in this study, which seeks information of importance for the general welfare, is appreciated.

Sincerely yours,

Monroe G. Sirken

Monroe G. Sirken, Ph. D.
Chief, Division of Health
Records Statistics

Name of Child	
Date of Birth	File Number

66M

CONFIDENTIALITY has been assured the individual as published in the Federal Register May 20, 1959

Form Approved
Budget Bureau No. 68-R823

NATIONAL BIRTH SURVEY

PART I. INFORMATION ABOUT YOUR CHILDREN

In this part, we are interested in knowing about all of the children which have ever been born to you, even if they were by a previous marriage.

1. How many babies have you ever had? (Count all those that were born alive to you at any time.)

☐ 1 ☐ 4 ☐ 7 ☐ 10 or more

☐ 2 ☐ 5 ☐ 8

☐ 3 ☐ 6 ☐ 9

Number

2. Have you ever had any children who have died? (Do not count miscarriages or babies that were born dead.)

☐ NO

☐ YES → Please list below the name, sex, date of birth, and date of death of each such child.

Name of child	Sex	Date of Birth	Date of Death

3. Were any of your children living away from you when your last baby was born? (For example, in the Armed Forces, living with relatives, etc.)

☐ NO

☐ YES → Please list below the name, sex, and date of birth of each such child.

Name of child	Sex	Date of Birth

4. Have you ever had any babies that were born dead?

☐ NO

☐ YES → How many have you ever had?

Number

5. Have you ever had a miscarriage?

☐ NO

☐ YES → How many have you ever had?

Number

6. After each birth, some couples feel that their families are completed, while others expect more children. In your case, do you expect to have more children?

☐ Definitely yes
☐ Probably yes
→ How many more children do you think you will probably have?

☐ Probably no

☐ Definitely no

Number

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REV. 3/66

(GO ON TO PART II) →

PART II. INFORMATION ABOUT YOUR FAMILY

In this part, information is asked about the members of the family who lived with you when your last baby was born.

1. List below everyone who usually lived in your household at the time your last baby was born. Be sure to list yourself, your husband (if he lived at home) and your newborn baby, as well as other children and relatives living with you. Unrelated persons who lived with you, and children who were away at school or college, should be listed. Do not include persons who lived away. (For example, persons in the Armed Forces). Also, do not include persons who were only visiting temporarily at the time your baby was born.

Enter your name on the first line; enter the names of every other person who lived with you, including your newborn baby, on the following lines. (First name) (Last name)	For each person, provide the information requested below.		
	Relationship to you (husband, daughter, son, father-in-law, nephew, stepson, adopted daughter, etc)	Date of birth Month-Day-Year	Marital Status (for persons 14 years and older). Married Divorced Widowed Separated Single (never married)
	Yourself		

(If more space is needed, please continue on separate sheet)

2. Who was the head of your household?

☐ Your husband

☐ Another person

↓

Name of head

3. What was the total income of your family during 1965?
(Include all income of all members of the family listed above even if they were not living together during 1965. Include income from all sources such as wages, salaries, unemployment compensation, help from relatives, profits and fees from own business or farm, welfare payments, Social Security payments, etc.)

☐ None
☐ Under $1000
☐ $1000 - $1999
☐ $2000 - $2999
☐ $3000 - $3999
☐ $4000 - $4999
☐ $5000 - $6999
☐ $7000 - $9999
☐ $10,000 - $14,999
☐ $15,000 or over.

PART III. INFORMATION ABOUT YOURSELF AND YOUR HUSBAND

In this part, information is requested about you and your husband.

1. Is this your first marriage?

☐ YES → Please give the date of your marriage.

Month	Day	Year

☐ NO → Please give the date of your first marriage.

Month	Day	Year

Please give the date of present marriage.

Month	Day	Year

2. Were you employed outside your home at any time during your recent pregnancy?

☐ YES → When did you stop working before your baby was born?

☐ NO

Month	Day	Year

3. What was the highest grade (or year) of regular school that you ever attended?

(Circle highest grade attended)

None---------- 0
Elementary---------- 1 2 3 4 5 6 7 8
High School---------- 1 2 3 4
College---------- 1 2 3 4 5 6+

3a. Did you finish this grade? ☐ YES ☐ NO

PART III. Con.

4. What was the highest grade (or year) of regular school that your husband ever attended?

(Circle highest grade attended)

None---------- 0
Elementary---------- 1 2 3 4 5 6 7 8
High School---------- 1 2 3 4
College---------- 1 2 3 4 5 6+

4a. Did he finish this grade? ☐ YES ☐ NO

PART IV. INFORMATION ON HEALTH INSURANCE

In this part, we are interested in finding out whether you were covered by health insurance at any time during your recent pregnancy. Please report on each kind of health insurance protection which you had, whether or not the insurance was used.

1. During your recent pregnancy, did you have health insurance to pay for doctor's bills for office visits or home calls?

☐ YES ☐ NO

2. Did you have health insurance to pay for hospital care at the time of delivery?

☐ YES ☐ NO

3. Did you have health insurance to pay for the doctor's bill for delivery of your baby?

☐ YES ☐ NO

PART V. PERSON COMPLETING THIS FORM

Name of person completing this form

_____

Address

_____

_____

Telephone Number _____

COMMENTS:

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REV. 3/66

1964-1966 National Infant Mortality Survey Questionnaire

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
WASHINGTON, D.C. 20201

NATIONAL CENTER FOR
HEALTH STATISTICS

The U. S. Public Health Service is conducting a survey to obtain information about infants who died during 1965. We realize that this is a difficult time; however, your help is needed in dealing with an important problem.

Loss of life among infants, especially in the first few hours or days of life has become a matter of increasing concern among public health workers in the United States. The purpose of this survey is to collect information about the childbearing experiences of mothers who have lost their babies, about the medical facts related to these deaths, and about the personal circumstances of the parents of these infants. This information is being obtained for one out of every 110 infant deaths occurring throughout the country.

This survey is designed to provide facts urgently needed in medical and public health research, the results of which may contribute to saving the lives of babies being born in your own community.

Please complete this form and return it within the next five days. A self-addressed envelope which requires no postage has been provided for your convenience. If you do not have the exact answer to a question, please give your best estimate.

The information you provide will be given confidential treatment and will be used for statistical purposes only. Any published summary will be presented in such a manner that no individual person or family can be identified.

Thank you for your cooperation.

Sincerely yours,

Monroe G. Sirken, Ph. D.
Chief, Division of Health
Records Statistics

Name of Deceased Infant _____ File Number _____

I3-1-5

Confidentiality has been assured the individual as published in the Federal Register May 20, 1959

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service - NCHS
Washington, D.C. 20201

Form Approved
B.B. No. 68-R783

1965 INFANT MORTALITY SAMPLE SURVEY

PART I. INFORMATION ABOUT THE INFANT WHO DIED

1. Was the baby in a hospital at the time of death?

☐ Yes ☐ No

2. Was the baby born in a hospital?

☐ Yes ☐ No

3. Please list each hospital in which the baby received care, even if only for a brief period. (Write in name and location of each place; include hospitals in which birth and death took place.)

Name of Hospital	City and State

PART II. INFORMATION ABOUT OTHER CHILDREN

In this part, we are interested in knowing about all of the children which have ever been born to you, including the infant who died.

1. How many babies have you ever had, including the baby who died? (Count all those that were born alive to you at any time.)

☐ 1 ☐ 4 ☐ 7 ☐ 10 or more
☐ 2 ☐ 5 ☐ 8
☐ 3 ☐ 6 ☐ 9

Number

2. Were any of your children living away from you at the time of birth of the baby who died? (For example, living with relatives, etc.)

☐ No ☐ Yes

Please list below the name, sex, and date of birth of each child living away from you.

Name of Child	Sex	Date of Birth Month-Day-Year

3. Have you ever had any babies that were born dead?

☐ No ☐ Yes

How many have you ever had? Number

4. Have you ever had a miscarriage?

☐ No ☐ Yes

How many have you ever had? Number

5. Have you ever had any other children who have died? (Do not count miscarriages or babies that were born dead.)

☐ No ☐ Yes

Please list below the name, sex, date of birth and date of death of each such child.

Name of Child	Sex	Date of Birth Month-Day-Year	Date of Death Month-Day-Year

PHS-4670-15 (page 2)
Rev. 2-65

PART III. INFORMATION ABOUT YOUR FAMILY

In this part, information is asked about the members of the family who lived with you at the time of birth of the baby who died.

1. List below everyone who usually lived in your household at the time your baby was born. Be sure to list yourself, your husband (if he lived at home) as well as other children and relatives living with you. Unrelated persons who lived with you, and children who were temporarily away at school or college, should be listed. Do not include persons who lived away. (For example, do not include persons in the Armed Forces.) Also, do not include persons who were only visiting temporarily at the time your baby was born.

Enter your name on the second line; enter the name of each person who lived with you on the following lines (Last Name) (First Name)	For each person, provide the information requested below			
	Relationship to the dead child (father, sister, aunt, cousin, grandfather, lodger, etc.)	Date of Birth Month-Day-Year	Marital Status (for persons 14 years and older) Married Divorced Widowed Separated Single (never married)	Date of first marriage for each person who was ever married. Month-Day-Year
	Deceased Infant			
	MOTHER			

(IF MORE SPACE IS NEEDED, PLEASE CONTINUE ON BACK PAGE)

2. Who was the head of this household?

☐ The child's father

☐ Another person →

Name of head

3. Have you been married more than once?

☐ No ☐ Yes → Write in date of present marriage.

Month	Day	Year

4. What was the total income of your family during 1964? (Include all income such as wages, salaries, unemployment compensation, help from relatives, etc., received by all members of the family you have listed above.)

☐ None
☐ Under $1,000
☐ $1,000 - $1,999
☐ $2,000 - $2,999
☐ $3,000 - $3,999
☐ $4,000 - $4,999
☐ $5,000 - $6,999
☐ $7,000 - $9,999
☐ $10,000 - $14,999
☐ $15,000 or more

PLEASE CONTINUE ON BACK PAGE

PART IV. INFORMATION ABOUT THE INFANT'S MOTHER AND FATHER

1. Were you employed outside your home at any time during your recent pregnancy?

☐ YES → When did you stop working before your baby was born?

☐ NO

Month	Day	Year

2. What was the highest grade (or year) of regular school that you ever attended?

(Circle highest grade attended)

None---------- 0
Elementary---------- 1 2 3 4 5 6 7 8
High School---------- 1 2 3 4
College---------- 1 2 3 4 5 6+

2a. Did you finish this grade? ☐ YES ☐ NO

3. What was the highest grade (or year) of regular school that the child's father ever attended?

(Circle highest grade attended)

None---------- 0
Elementary---------- 1 2 3 4 5 6 7 8
High School---------- 1 2 3 4
College---------- 1 2 3 4 5 6+

3a. Did he finish this grade? ☐ YES ☐ NO

PART V. INFORMATION ON HEALTH INSURANCE

In this part, we are interested in finding out whether you were covered by health insurance at any time during your recent pregnancy. Please report on each kind of health insurance protection which you had, whether or not the insurance was used.

1. During your recent pregnancy, did you have health insurance to pay for doctor's bills for office visits or home calls?

☐ YES ☐ NO

2. Did you have health insurance to pay for hospital care at the time of delivery?

☐ YES ☐ NO

3. Did you have health insurance to pay for the doctor's bill for delivery of your baby?

☐ YES ☐ NO

PART VI. PERSON COMPLETING THIS FORM

Name of person completing this form

_____

Address

_____

Telephone Number

_____

COMMENTS

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1964-1965 National Infant Mortality Survey Hospital Form

CONFIDENTIALITY has been assured the individual as published in the Federal Register May 20, 1959

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service - NCHS
Washington, D. C. 20201

Form Approved
Budget Bureau No. 68-R781

NATIONAL MORTALITY SAMPLE SURVEY - 1965

Hospital Report on Infant Death

Name of deceased infant _____ File Number _____

Date of birth _____ Date of death _____

Name of infant's mother _____

Residence of mother _____

Hospital or institution to which request directed _____

(Name) (Location)

PART I. INFORMATION ON DECEASED INFANT FROM HOSPITAL WHICH PROVIDED CARE

A. The birth of the infant: Please provide the following information about the birth of the infant if available from your records.

1. Length of pregnancy _____ completed weeks (OR: Date of last menses _____ (Month, Day, Year))

2. Weight at birth _____ lb. _____ oz. (OR: _____ Grams)

B. Periods of care of the infant: Please complete a section below for each episode of care at this hospital. IF BIRTH DID NOT OCCUR IN THIS HOSPITAL, CHECK HERE ☐ and begin with episode II, below.

Periods of Care	Admitted on	Discharged on	Final Diagnoses	Operations Performed
I (Birth Episode)	Birth date	☐ CHECK IF discharge by death; OR specify date: Month _____ Day _____ Year _____	_____ _____ _____ _____ _____ _____ ☐ CHECK IF newborn without immaturity, birth injury, defect, or disease:	_____ _____ _____ _____ _____ _____ _____ Check if none ☐
II	Month _____ Day _____ Year _____	Month _____ Day _____ Year _____	_____ _____ _____ _____ _____	_____ _____ _____ _____ _____ Check if none ☐
III	Month _____ Day _____ Year _____	Month _____ Day _____ Year _____	_____ _____ _____ _____	_____ _____ _____ _____ Check if none ☐

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PLEASE TURN PAGE

ID

PART II. CARE OF THE DECEASED INFANT IN OTHER HOSPITALS OR MEDICAL FACILITIES

According to your records or to your personal knowledge, was the deceased infant a patient in any other hospital or medical institution during its life span? (The birth episode is of particular importance, if this did not occur at your hospital.)

☐ YES ☐ No ☐ Unknown

Please list below each other hospital or institution in which the deceased infant received care.

OTHER HOSPITALS OR MEDICAL FACILITIES IN WHICH THE DECEASED CHILD WAS A PATIENT

1. Name of Hospital or Institution _____

   Street Address _____

   City or Place _____ State _____

   Approximate Discharge Date _____

2. Name of Hospital or Institution _____

   Street Address _____

   City or Place _____ State _____

   Approximate Discharge Date _____

REMARKS:

Signature of person completing this form _____

Name of this hospital or institution _____

Your position in this hospital or institution _____

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